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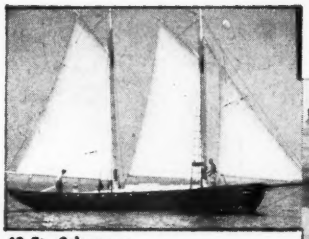
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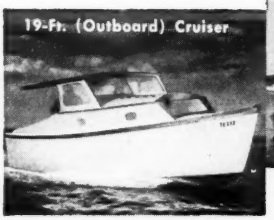
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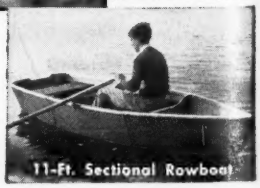
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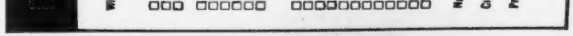

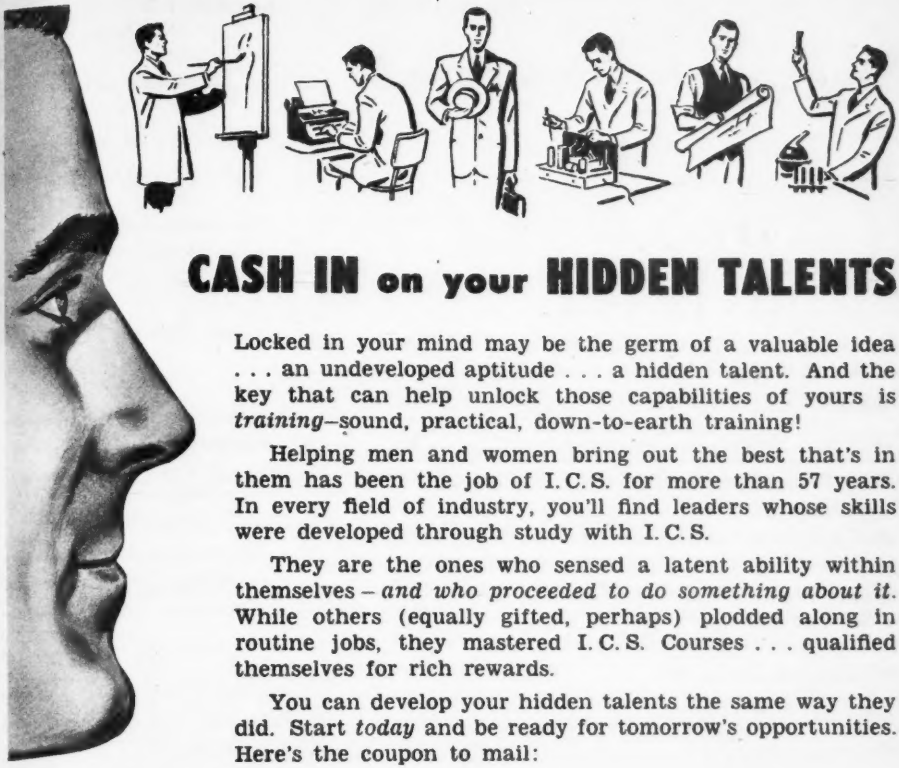

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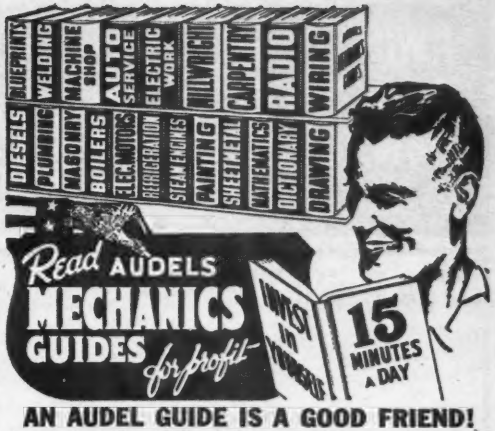

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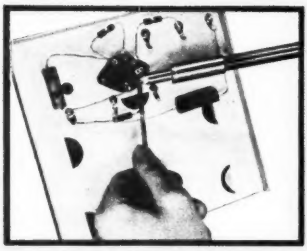

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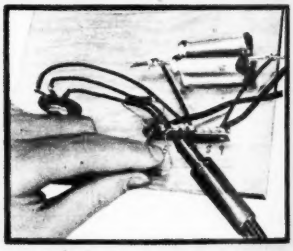

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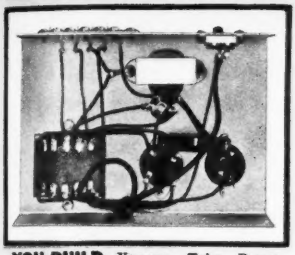

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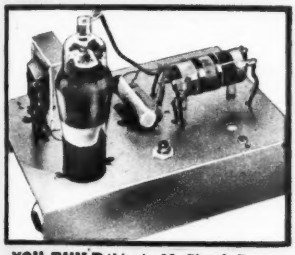

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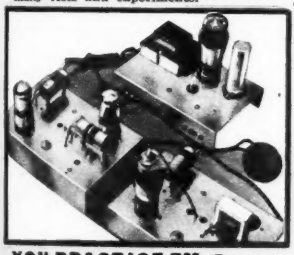

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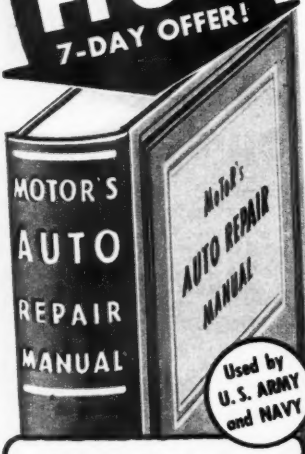

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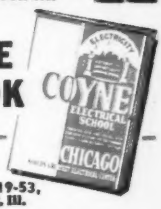

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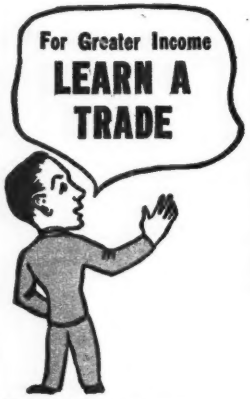

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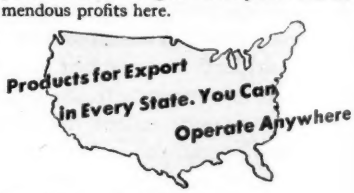

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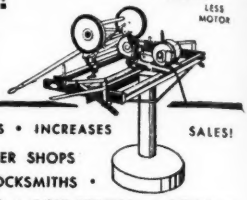

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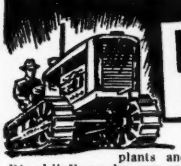

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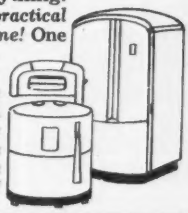

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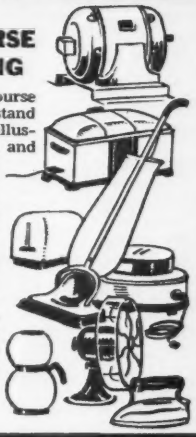

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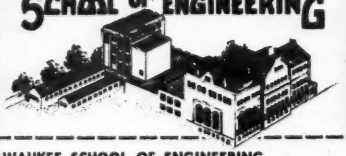

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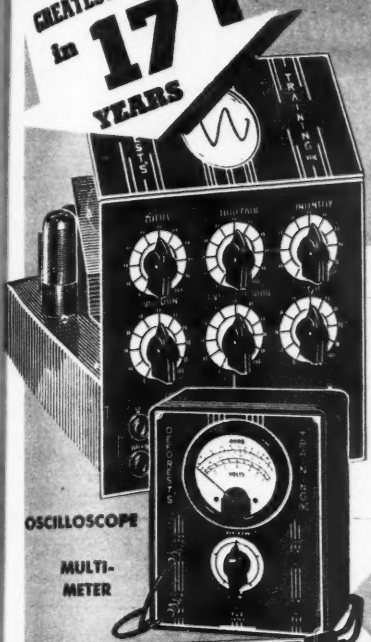

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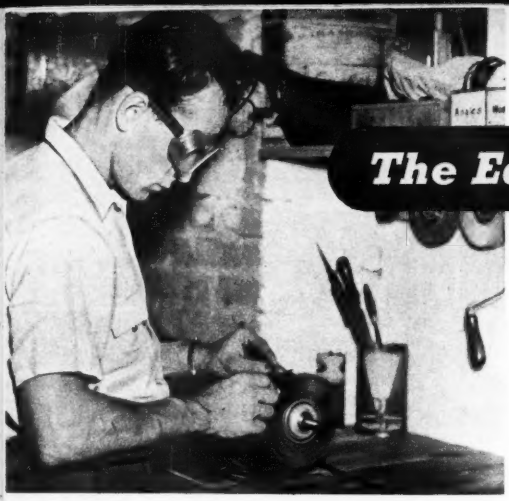

The Editor's Workbench

MI artist Hal Kelly uses a wire scratch brush to remove burrs while working on metal project.

Your Dream Car, Too?

A lot of old gents like ourselves (and some who aren't so old) have been complaining about the new cars. Say they're too bulky and cumbersome-looking, like a shoebox on a roller skate. Say they all look alike. Say they wish the car manufacturers would flip back the calendar to The Good Old Days, when every car had distinctive, original lines you could spot right off—like the Pierce-Arrow's wide-spaced, fender-mounted headlights, Packard's famous hump-backed radiator, and the air-cooled Franklin's ski-jump hood.

Well, we got to talking about it with Tom McCahill, MI's Doctor Boswell of the automobile industry, and we discovered that Tom's conception of what a car should look like (and perform like) comes a whole lot closer to our own old-fashioned notions than it does to Detroit's new-fangled didoes. Tom's idea of a red-hot automobile, we found out, is a specially blended mixture of dream dust compounded from the finest features he has seen on the finest cars he has test-driven over the past twenty and more years. In other words, the bestest of the bestest.

What does Tom McCahill's Dream Car look like? Turn to page 66 and take a gander at artist Dave Lockhart's drawings. In our opinion, this is about the classiest horseless carriage a man could want. Now, if there are any MIllionaires in the crowd who'd like to put up the dough to build one of these jobs. . . .

Build a Boat This Winter

And speaking of all-time favorites, we doubt if there has ever been a one-design sailboat that has even approached the tremendous popularity of the 15-foot Snipe. The shot which follows, for instance, was snapped off Rio de Janeiro, Brazil, home port of only one of the hundreds of Snipe fleets throughout the world.

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[*Continued on page* 166]

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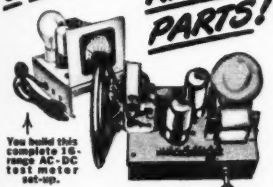

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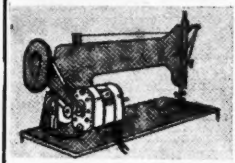

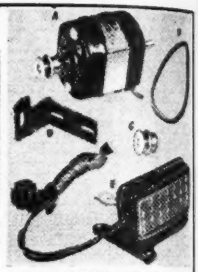

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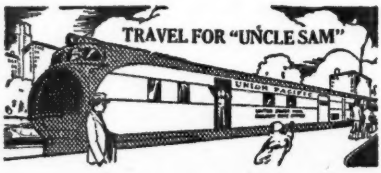

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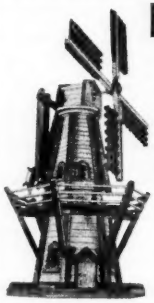

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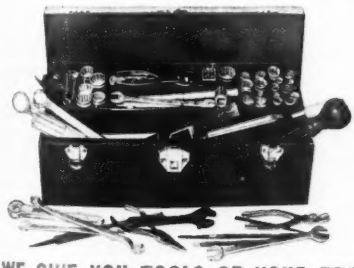

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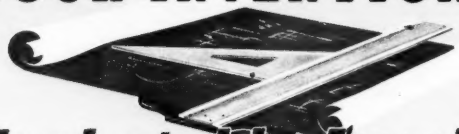

Conducted by Joseph H. Kraus

To facilitate the answering of their mail, readers desiring the advice of Mr. Kraus on inventions matters are requested to observe the following simple rules: 1) Type or write clearly, on one side of the paper. 2) Make sure that your full name and address, including street number and postal zone, if any, are on the letter and all accompanying papers. 3) Mail drawings or photographs flat, not rolled, and include postage if you want them returned. 4) Do not ask questions relating to patent laws. 5) Do NOT send models.

Address your inquiries to "Your Invention Clinic," MECHANIX ILLUSTRATED, 67 West 44th Street, New York 18, N. Y. Mr. Kraus will answer as many letters as possible in this column. His services are free.

Soapstone Sharpener

Stanley A. Van Derlick of Hartford, Conn., sends a design for a soapstone sharpener and asks our advice about marketing it.

ANSWER: Your best bet is to manufacture the soapstone sharpener yourself. If the public accepts your product, you can then arrange for national distribution either directly or through agents.

By the way, this same design for a tool may make a good pencil sharpener. You can stamp it from thin metal stock. Sharpened automatically, this device would insure a good point with a knife-cut taper at the end.

Why not make a few pencil sharpeners and test them? Sales here should multiply your money-making possibilities a hundred-fold.

Combination Doorstop

Homer D. Miner of Buena Park, Calif., wants our recommendation on a combination doorstop unit. Details are being withheld in accordance with our policy.

ANSWER: This looks like a sound article. We recommend a search. If you can patent your article, you should then see whether you can sell your doorstop idea or market it yourself.

As many different styles of doorstop are already going begging today, chances for sale are somewhat limited. Your final action should depend on a thorough evaluation and analysis of your personal abilities for success.

Cigaret Roller—Dry Shaver

Francis M. Van Fleet of Wilmington, Calif., wants our opinion on his designs for a cigaret roller and for a dry shaver.

ANSWER: If you can make these devices work properly, they should be good. But we doubt that you can. Should your cigaret roller operate as well in the hands of friends as when you run it yourself, you should have a search made to see whether you can patent your invention.

The motor you indicate for the dry shaver will give no power whatever. Here again you should complete and test the model before doing anything further with the idea.

Carpenter's Level

Oscar M. Stevens of Eau Claire, Wis., queries us about a design for a carpenter's level of the pendulum type.

ANSWER: Your suggestion is neither new nor good. It's 10 times as costly to make as the conventional level. The first time you drop your pendulum level you can kiss it good-by. It does nothing that the modern bubble cannot do. And the latter is not likely to stick. Better forget it.

Brick to Speed Building

Harold D. Morse of New Orleans has designed a new brick which he thinks will speed up building. He'd like to know the value of his design.

ANSWER: Sorry, Mr. Morse, but your design has no value. Bonding material must cover all the brick surfaces that touch each other to keep moisture from seeping between the joints. In your design you have touching surfaces which have no bond. Moisture entering there may freeze in cold weather and shatter the bricks, since water expands when it turns into ice.

Your brick also would be harder to manufacture. It would have to be perfect despite the rough treatment bricks usually get before they reach their resting place in the wall. Breakage would be greater and therefore many more bricks would be a total loss.

With your setup it would be more difficult

[*Continued on page* 32]

INVENTORS

Unless an inventor is thoroughly familiar with such matters, he is advised to employ a competent registered patent attorney or agent as the value of patents depends largely upon the skillful preparation of the specification and claims.

For his guidance, the following are the usual preliminary steps which the inventor takes toward patent protection.

The "Evidence of Invention" form mentioned below is offered as a convenience to the inventor in making his disclosure of invention.

The inventor should date and sign his disclosure and have it witnessed by two or more persons who are capable of understanding his invention. The disclosure should then be mailed to the registered patent attorney or agent whom he selects to assist him. The disclosure should be accompanied by a letter authorizing the patent attorney or agent to conduct a preliminary search among previously granted U. S. patents for similar types of invention. The patent attorney or agent then prepares a report of the probable patentability of the invention and recommends the further course the inventor should take, provided the report indicates possible patentability.

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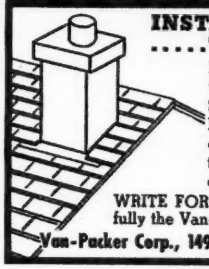

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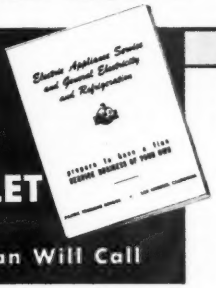

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[*Continued from page 28*]

to feed cement into the space between the bricks and still keep the surface clean than it is with the hand-laying method in general use today. So, in addition to the other troubles with your design, it's actually not a faster, but a slower, way to lay bricks.

Dual-Crank Engine

Richard A. Williams of Tacoma, Wash., sends a design for an explosive engine with dual cranks that he thinks will eliminate piston wear.

ANSWER: This appears to be a rather old design. It embodies the same principle as Lancaster's steam engine and represents in reverse form the Worthington compensating cylinder.

The wear you may eliminate in the cylinder probably will be more than outweighed by the increased wear of crankshafts, arm and gears. Despite the use of all these extra parts, you get no increase in power and greatly increase the chances for breakage. We see no justification for the extra machining, the tooling, the redesign or the noisy gears.

Multiple-Speed Attachment

John G. Lownsbery of Richmond, Va., sends his patent application, photos and drawings of a device that you can attach to any electric motor to give variable-speed drive. He wants to know what we think of his invention.

ANSWER: There should be a good market for an article of this sort, especially among workshop owners. Most motors, though, will need long studs or stud extensions. Since shaft sizes also vary, you should make the pulleys available in different sizes.

The mounting plates, though, will cause the worst trouble. They must be made so that you can adjust them to any of the more popular motors. Yet with careful study and redesigning you can overcome all these difficulties. I suggest that you apply a chuck to the shaft or thread it for that purpose.

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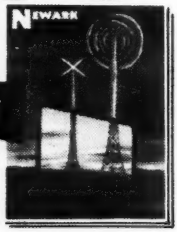

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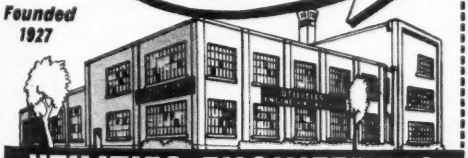

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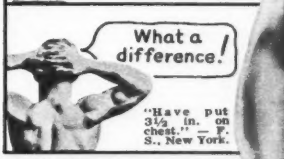

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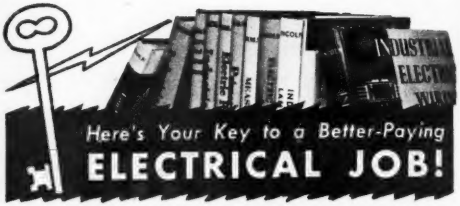

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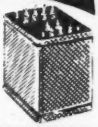

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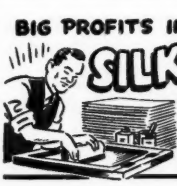

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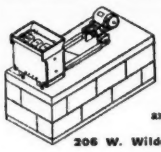

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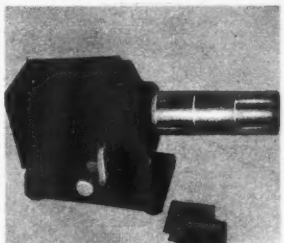

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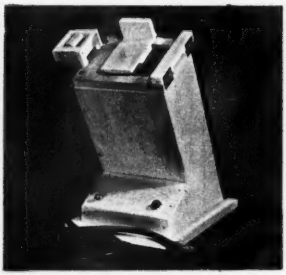

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GUSTAVE MILLER—Patents and Trade Marks—19-C Warner Building, Washington 4, D. C. Registered Patent Attorney. Associate Patent Examiner, U. S. Patent Office 1922-1929.

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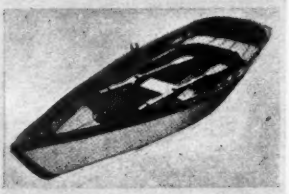
LAKE SKIFF PLANS



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BOAT PLANS, kits—See display advertisement page 161. Marine Mart, Buffalo 7-H, N. Y.

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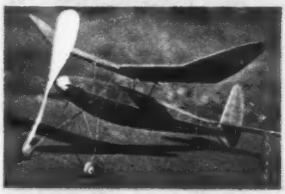

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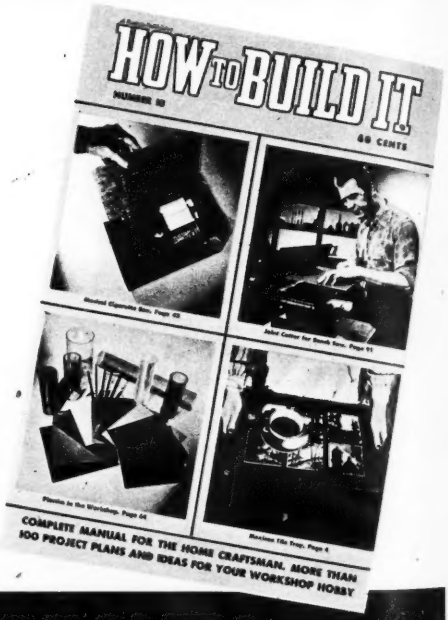

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Demonstrations win new customers. Men with **DURACLEAN** Dealerships find **REPEAT** and **VOLUNTARY** orders become a major source of income. Customers are not merely satisfied—many are enthused with results and tell their friends and neighbors. Furniture and department stores and interior decorators turn over rug and upholstery cleaning and mothproofing to **DURACLEAN** Dealers. We show you **18** ways to get *new* customers.

Two-Way Profit

You enjoy big profits on both materials and labor—after paying service men and salesmen. These are year 'round services for which there is always a constant need. You have National prestige and the cooperation of a National **18 YEAR OLD** organization interested in your services. The rapidly growing need for Certified Service makes TODAY the ideal time to become the owner of a **DURACLEAN** Certified Service business.

Dealer Comments:

R. Kimbrough: "Finished First White House of Confederacy and am to **DURACLEAN** Governor's Mansion."

E. C. Bristol: "Duraclean produced amazing results."

Milton Lassanske: "To date, most of my business comes from recommendations. . . . My original investment was returned in about two months."

E. Schalchlin: "Have on hand 5 orders totaling over $500 . . . obtained from recommendations of customers."

EASY TERMS!

A moderate payment establishes your own business. Easy terms permit you to pay balance from your sales. We furnish electric machines, folders, store cards, introduction slips, sales portfolio, demonstrators and enough material to return your **TOTAL** investment. You can have your business operating in a very few days. Mail coupon today! No obligation.

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Division of HOME SERVICE CO., 17-1 Pl., Deerfield, Illinois

With no obligation to me, send booklet and letter giving full details. Tell me how I may OWN a growing business of my own built upon satisfied customers.

Name..... Age.....

Address .....

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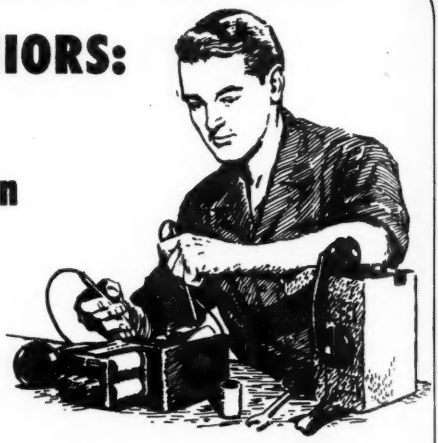

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When you finish high school in January or June, plan to complete your education in one of the U. S. Army specialty schools. You'll get good pay while learning, plus free board and room, free clothing and equipment, medical and dental care. And you'll share in the U. S. Army's great retirement plan. After you have finished high school, select the army course you want. Get the facts . . . without obligation . . . at your nearest U. S. Army Recruiting Station.

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These are just a few of the courses offered in more than 60 Specialty Schools of the U. S. Army. In these schools you use the latest equipment . . . learn from the finest instructors.

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mechanix illustrated
January 1949

Be Young at 100!

By Roger Dunham

Those creeping years worrying you? Forget it—old age is mostly superstition, doctors discover.

Pop Carter, rolling along merrily in his 90s, never minds his age as he spread-eagles on skates during a Los Angeles exhibition.

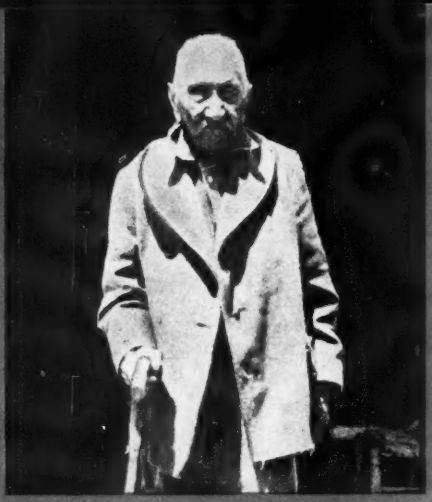
HOW long will *you* live? Fifty, 70, 80—maybe even 100 years—a whole century?

Till the day you die you'll probably keep thinking you can always squeeze out at least one more year from those old bones of yours. And ever since 1848 when the average American dropped dead before 40, we have indeed squeezed out extra years until today our national life span has stretched to 67.

That's still far short of the century mark. Yet some medical experts now say that not only should you live to be 100 but keep breezing right along, hale and hearty, for another half-century.

Living to be 100 is kid stuff, according to Dr. Edward L. Bortz of Philadelphia, a former president of the American Medical Association. A dog is full-grown at two years, but lives, on

Faster at 75 than most runners in their 20s, John L. Sullivan, right, beat Joe Fuccaro, 26, in 5-mile Syracuse race.



"Only 137," said Francisco Sais of Arabella, N. M., about his age. He has his third set of teeth now.

J. C. Bee-Mason, above, a bee expert, is wearing a suit of 40,000 bees (count 'em!). Bee stings, he bee-lieves, will help him reach 100. Pool-Shark Bill Clark of Philadelphia hit 100 four years ago.

an average, to be 12; a horse, mature at four, lives to be 25.

"Man," Dr. Bortz points out, "reaches physical maturity at 25, emotional maturity at 35, intellectual maturity at 45. Spiritual maturity comes at even later years.

"A human being should have a life expectancy of 150 years."

Two leading scientists, Dr. Theodore L. Klumpp, Winthrop Chemical Company president, and Dr. Maurice L. Tainter, Sterling-Winthrop Research Institute director, back up Dr. Bortz in his belief that you should live more than twice as long as current life-expectancy tables say you will.

"The success of our efforts to prolong existence to this supposed natural life span depends upon our ability to maintain the lifeline of blood supply to the body tissues," Dr. Klumpp says. "Few die from old age; they die prematurely from degenerative diseases."

A new science called Geriatrics seeks to combat these diseases and make you active and productive all your life.

Dr. V. Korenchevsky, of the Gerontological Research Unit at Oxford University, which is studying old age and its effects, thinks that the human span can be extended to 112 or even beyond. But he feels that the main aim should be to make old age firmer and healthier, not merely longer —in other words, "to add life to years, not just years to life."

Life begins at 70, in the Geriatric Clinic of Boston's Peter Bent Brigham Hospital.

"We tend to assume that after 65 a person loses his usefulness and becomes a second-rate citizen," the clinic's officials state. "This is not so. Old age should not bring the depression it does."

Recently a conference of medical specialists and surgeons at the DeCourcy Clinic in Cincinnati concluded that *you can keep your vigor despite the advancing years.* Those years alone won't bring you old-age troubles, the doctors found. If you think you have to lose your pep or start falling apart from senile decay just because you're getting old, you're suffering from a "time neurosis."

"Every human tissue is endowed with potential immortality," the doctors decided, "when adequately provided with food factors, oxygen and suitable warmth, and when removal of wastes is carefully effected. Time has no effect on human tissues maintained under such conditions—or, indeed, on human tissues under any conditions. . . .

"Belief in the effects of time tends to reduce ambition. Therefore, expectations

and endeavors are curtailed. All those who develop a time neurosis subscribe to the prevalent superstition that time is in some way a poison exerting a mysterious, cumulative action.

"The obsession itself may be the cause of definitely premature aging. Confidence and hope are diminished; continual worry decreases efficiency and increases nervousness and irritability. Life assumes a somber hue. Imaginary symptoms are noted with increasing frequency. The mind or the heart may seem to be failing. . . .

"When a time neurosis is treated successfully, the patient becomes younger than at the time he entered your office."

The chances for living to be 100—and liking it—are far better today than they ever have been before. If you were a woman, those chances would be even finer, since there are four times as many women centenarians as there are men.

One of these long-living ladies was born in Belorussia during Napoleon's Russian campaign. Her name is Maria Nikolaevna Kuzmich, and she is still enjoying an active life in her village, Ostrovschina Polotzk. In all her 135 years of life she has never been ill.

In this country "Uncle Jim" Wilson, a Negro, of Vidalia, Georgia, lived to be 120. Four years before his death, in December, 1945, Uncle Jim walked into county welfare headquarters and asked if he qualified for an old-age pension. The U.S. Census Bureau checked and double-checked, and finally verified his birthdate—May 15, 1825. Uncle Jim was born in slave quarters in southeastern Georgia, not too far from his home at death, 120 years later.

His recipe for long life? A diet of lean meat, eggs, cheese, biscuits, milk and living moderately.

On the other hand, Uriah Stohler, who passed his 104th birthday last year in Kleinfeltersville, Pa., swore off meat entirely at an early age, and recommended only one meal a day for long life.

But these venerable characters are still in short pants compared to the mother of Ahmah Gaga Singh, who claims to be 112 himself. He states authoritatively that she is still living in [*Continued on page* 156]

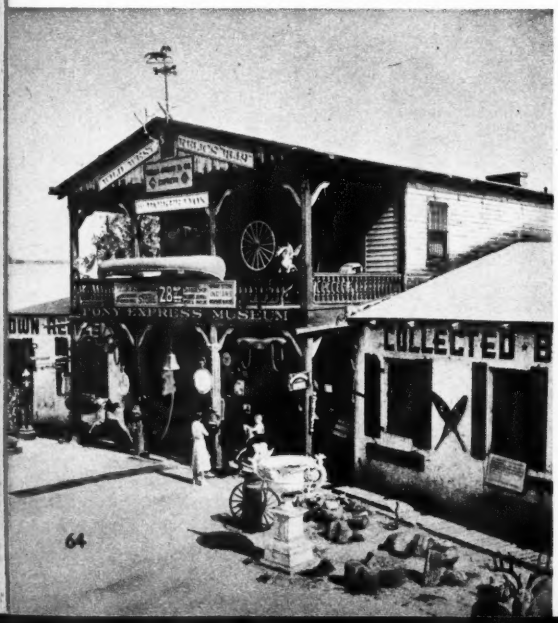
Greenville, S. C., drivers rubbernock when Harry Kramer, 75, does his daily stunts on his ancient bike. Walter Morgan achieved a life ambition when he 'chuted at 76.

Ghost-Town Graveyard

Photos by Louis Hochman

Arrowhead that killed a pioneer still juts from his skull.

Here's how Ghost Town's main street looks to a sightseer.



EVER wonder what happened to our colorful Wild West where a man was a man till the Injuns—or the gamblers—scalped him?

The horseless buggy buried the Old West in its dust. Then W. Parker Lyon, an Easterner who made a fortune running moving vans up and down the Pacific Coast, began digging out relics of those glorious, gun-happy days. He started a collecting hobby by buying a stagecoach and ended up by building a curiosity-jammed Ghost Town of the Wild West at Arcadia, Calif.

Looking much like Buffalo Bill himself, Mr. Lyon often thrills visiting school children by standing guard with an ancient rifle in front of his Pony Express Museum. Among his prize relics are bullet-battered faro tables, bones, guns and daggers that settled many a brawl. Some of these "ghosts" gallop out of their grave to live again in a Western movie. •

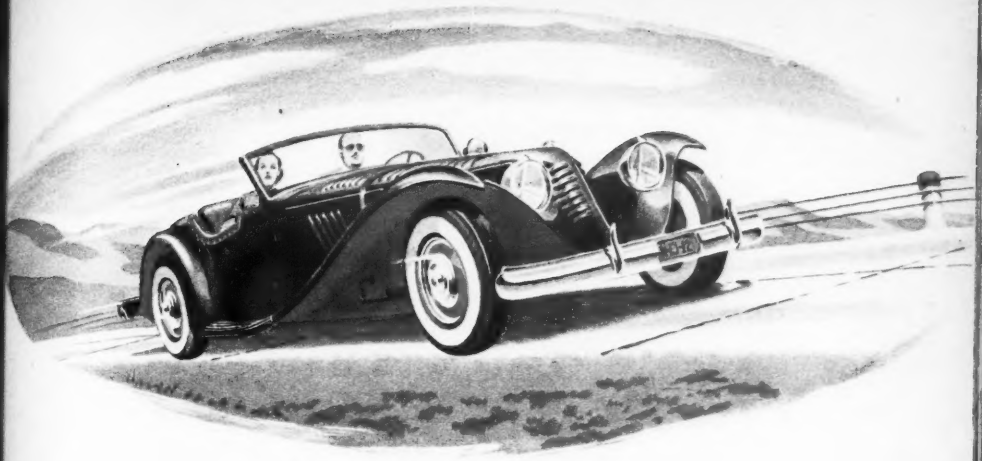
Churning butter was sport for kids back in the '60s when they could do it with this "seesaw."

Indians used scalp box, above, for trading. Blond scalps were considered most valuable.

Gun-toting tree helped Lone Bandit Charlie Jack "gang up" on Mammoth Trail victims. He tied pistols in trees before a holdup.

W. Parker Lyon, below, shows how $20-a-day lookout sat on special swivel seat to plug the first card shark to try any tricks.

THE McCAHILL MI



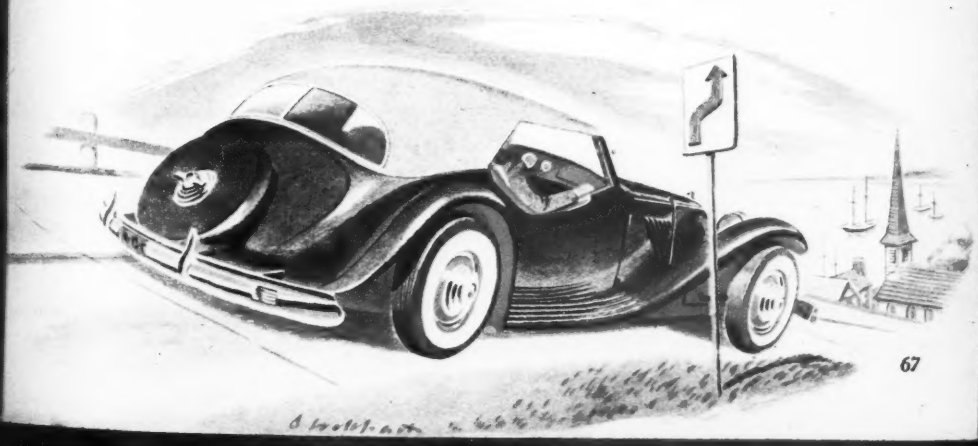
McCahill Builds His Dream Car

Hoop-skirted, duck-waddling new jalopies are fine—for women, says MI's auto expert. Now here's a real man's convertible . . .

"TOM," one of MI's editors asked, "what's your idea of a *real* automobile?" This editor had recently shelled out nearly $3000 for a new convertible and he was far from convinced that it was a dreamboat. Out of that question, this article was born.

Fortunately for the world, and industry in particular, there's a wide variety in tastes. Some men can be happy even though they're not married to a blonde; other guys buy and wear suits you wouldn't be buried in. Tastes in automobiles are varied, too—except that in America a man's preferences in car styles are limited to a few available choices, all of a monotonous similarity.

The new American cars look pretty much alike. They waddle like ducks and are heavy and (to me) unsightly. They meet a standard created mainly for American *women*. If you are married, chances are your wife makes the final decision on whether you buy a Squirrel Hormone Eight or a Dehydrated Panda Six. The car she picks must ride the bumps like sponge cake dropped on a charlotte russe. It must be as big as or bigger than Mrs. Jones', even



Built by Brewster 20 years ago, this Rolls-Royce still looks snappy—thanks to clamshell fenders, which McCahill favors for his dream job.

Photo courtesy J. S. Inskip

though it hasn't enough power to pull a greased gumdrop out of a baby's mouth.

If you think I'm exaggerating, talk to the engineers at any major auto plant. They don't like the new cars any more than Mrs. Smith's husband does. But they get their orders from the sales division of the company.

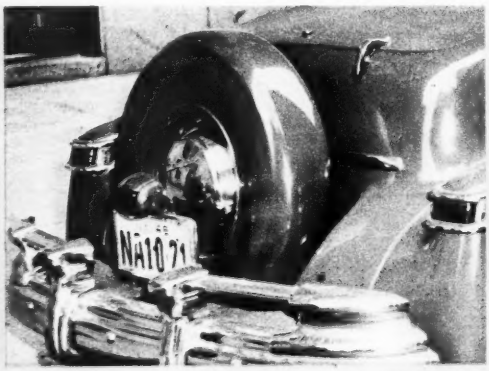
The only choice American men have today is in the power plant. There still is plenty of variety of engines, with many fine ones on the market.

My dream car, which I'll call The McCahill MI, would be built for the automotive male of the species—and, frankly, to hell with his wife. My formula for building a car would borrow a chapter from the old wedding tradition—something old and something new, something borrowed and something blue. The blue is for the Sad Sack who can only dream about those custom sports jobs in the showrooms of dealers who specialize in foreign makes.

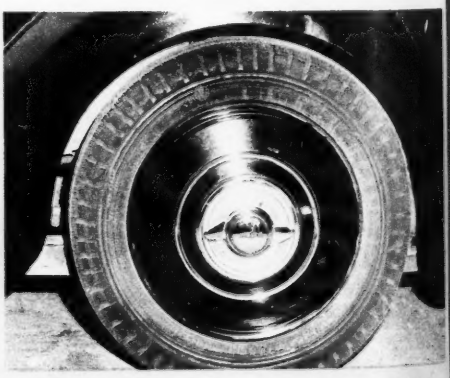
My car will have the real beauty of functional lines, with no falsies or hoopskirts. The design will be practical and will emphasize real craftsmanship, performance and quality. It will look something like a Maseratti from the windshield forward, and something like a Lincoln Continental convertible from the windshield back to the spare tire—which spare will be *outside* where it belongs.

As to the fenders, I'll take a chapter from our English cousins and our own past. They will be clamshell style, like those on the Rolls-Royce of a few years ago, and they'll be made of aluminum. If you smash a fender, you won't have to get the entire body rebuilt. Under *no* circumstances will my car have fender pants or similar geegaws.

The wheels will be the racing Rudge type, similar in this respect to another British job, the Jaguar. These wheels are a cinch to change, even on a dark, stormy night. All you have to do is give the lug



Spare on Tom's car will be outside—as on this Lincoln.



Wheels will be easy to change—like those on the Jaguar.

Frank Kurtis, left, shows the metal top on his hand-made, 120-mph convertible to Tom. The MI's aluminum top will be designed like this.

wing a tap. Off it spins, with no nuts or studs to break your knuckles.

The top will be convertible, a semi-solid aluminum affair covered with canvas like the one on the Frank Kurtis car in the October, 1948 issue of MECHANIX ILLUSTRATED. This will give the safety of a sedan top when up, and the pleasure of an open car when down. There will be no motor to raise and lower it and get out of order. You'll have to stop, get out and put the thing up yourself. It's not so easy that way but it's twice as reliable. The hood will be a modified Maseratti in looks and the headlights will be the real McCoy —either English Lucas or Marchalle.

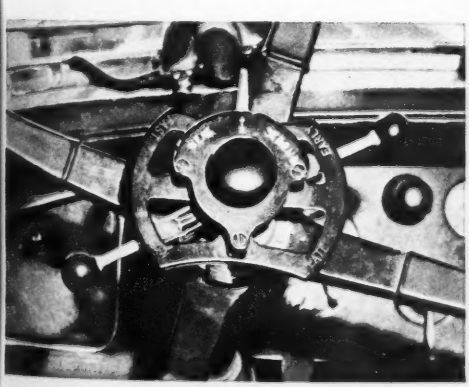
The McCahill MI will be low, sleek and moderately wide. The wheelbase will be 118 inches. It will have the bed arrangement of the Nash, whose front seats can be dropped back level with the rear seat to form a wide, comfortable bed. There will be a center armrest for the driver. The entire car, though low, will have a clearance of at least 7½ inches. There will be side vents for additional cooling, as in the Studebaker.

My hood will be well vented and will lift from the sides. It will be extra deep on each side, so that when it is raised the entire engine will be exposed. This will enable the owner to work on the motor without turning himself into a Hindu contortionist. Everything will be as easy to get at as Durante's nose.

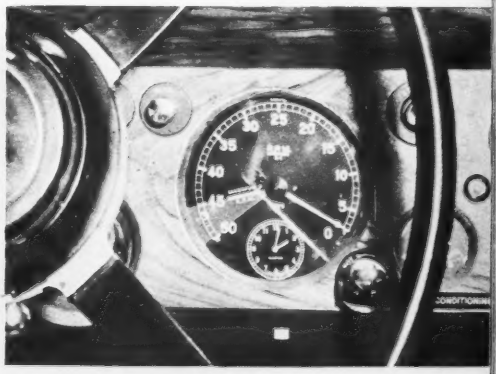
Speaking of work, my car will come equipped with a real set of high-grade tools and wrenches. None of this stuff the dime store wouldn't sell—such as you find in many of our new cars.

If you are looking for automatic chokes, duck-waddle ride, 24-pound-pressure balloon tires, high-gear ratio steering, bathtub body and fenders in one piece, you won't like The McCahill MI.

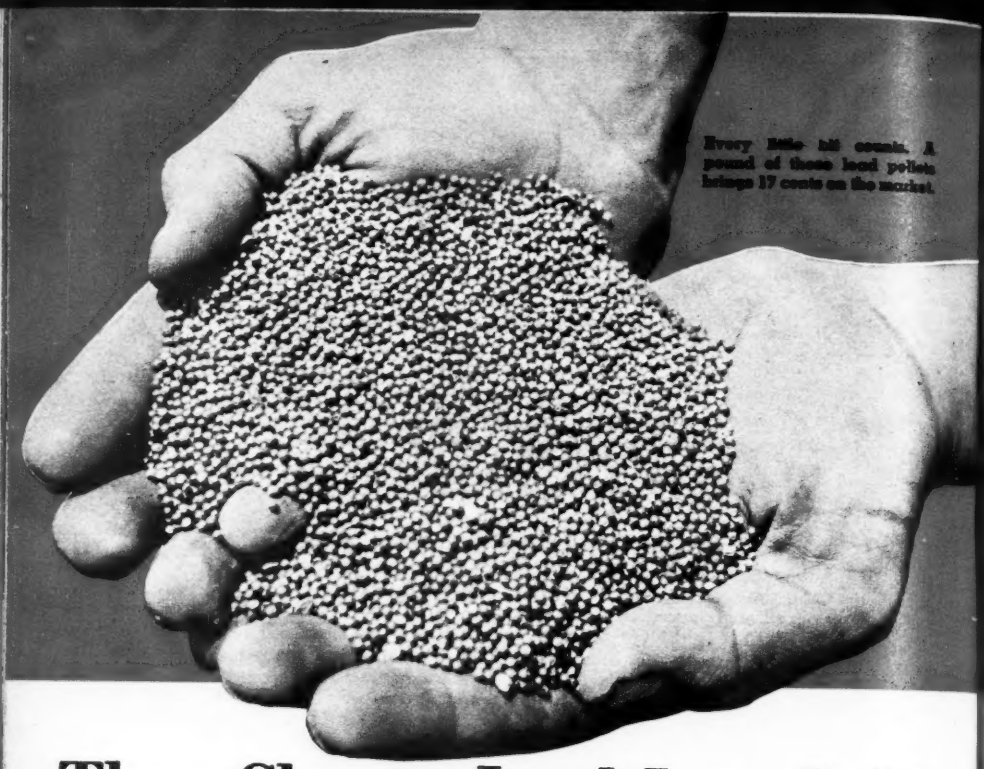
From a great automobile of earlier vintage, the Wills St. Clair, I'd take the automatic [*Continued on page* 160]



MI's steering wheel will carry spark, throttle controls.



Tachometer on the dream car's dash will tick off rpm's.

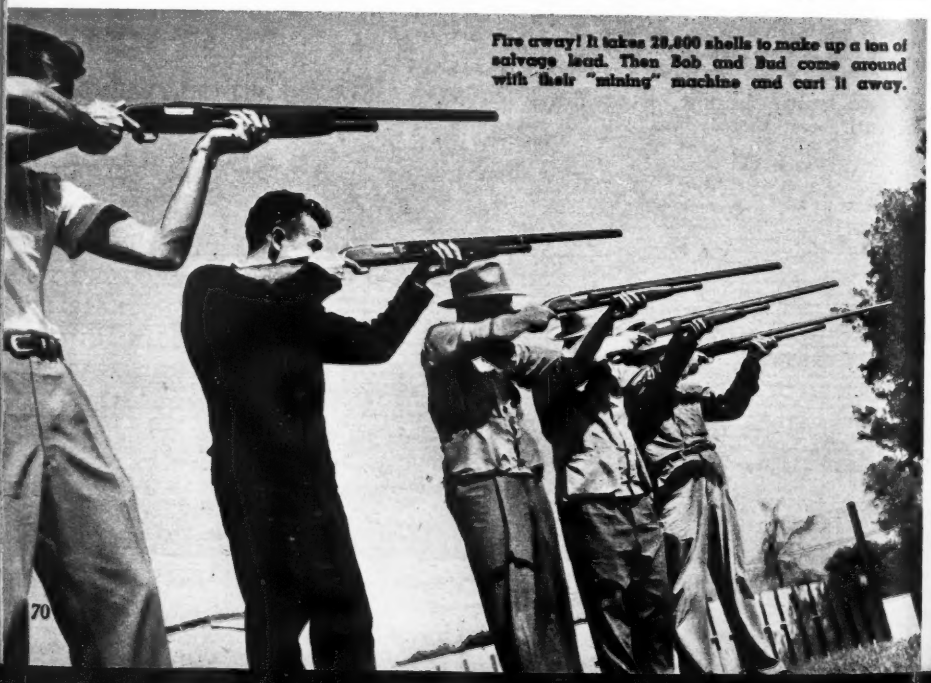


Every little bit counts. A pound of these lead pellets brings 17 cents on the market.

They Change Lead Into Gold

Bob Roth and Bud Knox, American-style alchemists, dig up gun-range buckshot and sell it for a profit.

By L. Hochman



Fire away! It takes 28,800 shells to make up a ton of salvage lead. Then Bob and Bud come around with their "mining" machine and cart it away.

ANCIENT alchemists worked like beavers to turn base metals into gold—and failed. However two modern-day alchemists, Bob Roth and Bud Knox, have succeeded in turning bits of lead into a gold mine.

These "prospectors" do their mining on the shooting ranges of the West Coast. A gun range, during a four-day state competition, may have a ton of lead scattered over its area. Retrieving this buckshot has become the full-time occupation of Bob and Bud.

They took an old grain combine, stripped it down, rearranged its innards and remodeled its body. Then they installed a crusher, two blowers, a system of vibrating screens and baffles and an elevator conveyor belt. They wound up with a roaring infernal machine which eats earth, belches clouds of dust through its rear, and daintily spits tiny lead shot into a receptacle underneath. The partners sell this salvage lead to battery manufacturers for 17 cents a pound.

The earth is carried by the conveyor belt up to a crusher which pulverizes and weeds it. Then, it drops through the vibrating screens and baffles, and sifts past the blowers which blast the dust out through the rear while permitting the heavier lead shot to fall through the bottom into a large wooden receptacle.

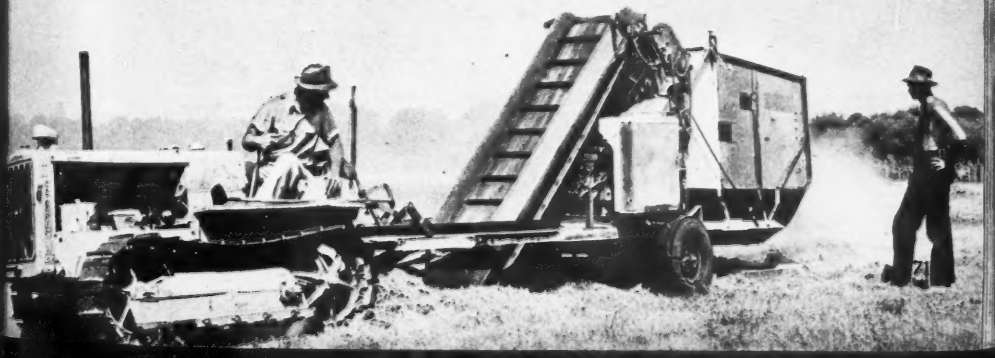
Most gun ranges are surface-mined to a depth of four inches. But at the Lakeland Gun Club in California, where a pasture crop had been planted the previous year, they had to go down to a depth of ten inches.

Roth estimates that it takes at least ten years before a fairly active range becomes loaded with enough lead to make it a profitable mining proposition. Income varies with the uncertain yield of the various ranges they've mined. The partners pay the range either a fee or a percentage for the privilege of mining their field.

"We average about 60 bucks a week apiece on this deal. It's not a fortune but the important thing is that we're our own boss," says Bud.

Medieval Emperor Charlemagne, who had a staff of alchemists working for him, probably won't turn over in his grave because of the success of these partners. But they certainly have proved that alchemy on a modified scale pays off. •

Bob spreads the dirt evenly on the conveyor belt while Bud drives the tractor, above. Then the dirt is pulverized and dropped through vibrating screens which sort out the buckshot and blast the dust away, below.



Will Polar Waves Swamp Am

Engineer Brown fears the vast Antarctic icecap may upset the world and drown us in a great flood at any moment!

By West Peterson

p America?
TURN PAGE

Survivors of our toppled world would discover a weird jumble of ancient shipwrecks, rotting whales and stranded liners as they trekked to safety across the dry, cracking ocean bottom.

Will Polar Waves Swamp America?

FARMER Williams was plowing the field back of his red barn in central Indiana shortly before noon. A few more furrows and he could quit for lunch. Then above the regular clatter of his tractor he heard an ominous, ground-shaking rumble. He turned on the tractor seat—and saw a towering mountain of water roaring down upon him.

The sweeping wave brought death to Farmer Williams and churned the Mid-West into an inland sea.

This may be the doom of America and our world as we know it. And that doom may crash upon us at any moment, according to Hugh Auchincloss Brown, 69-year-old electrical engineer of Douglaston, Long Island.

Engineer Brown firmly predicts this battered old earth is long overdue for another great flood unless we can put off our Day of Doom with a $10,000,000 atomic project.

Brown declares we must blast the Antarctic icecap with atom bombs!

It sounds utterly fantastic. Yet the theory has received serious attention in the press and certain scientific circles. Brown, a modern-day Noah, has spent much of his spare time over the past 35 years in building up his theory. He has even printed a treatise entitled "Popular Awakening Concerning the Impending Flood."

Here are the two premises stated in the foreword to Brown's work:

"1. The earth rotates on its present axis because of the centrifugal force caused by its equatorial bulge, which became established at the time of the latest flood. The centrifugal force of that bulge alone now temporarily prevents its rotating about some different axis.

"2. The centrifugal force of eccentric rotation of the great South Pole icecap tends to careen the globe. That force of rotation will roll the earth over and move Antarctica and its icecap almost directly under the sun because in due time it will neutralize and overcome the centrifugal force of the earth's bulge. During the reeling period the earth will experience another of its recurrent great deluges when most living things perish. . . ."

In other words, according to Brown's forecast, the weight of ice at the South Pole is going to pull the "wobbling" earth off its present axis. After the globe tilts the North Pole may be found somewhere

in the equatorial Pacific, with the South Pole in Africa.

Brown cites two factors which, combined, will cause the shift.

In the first place, he asserts, it was discovered as far back as 1895 that the earth is spinning off-center. Astronomers over the past half-century have noted that the poles are "wandering."

Secondly, the icecap at the South Pole is constantly growing. When the weight increases sufficiently, it will throw the earth off its present orbit completely.

It's happened before at 8000-year intervals, the engineer says, and it's bound to happen again! But Brown declares it is impossible to set any definite date for the disaster. His Doomsday may come in the year 2000, or 2048—or tomorrow!

The danger lies at the South Pole instead of the North, according to Brown, because the latter has a relatively small amount of ice. Here's how he describes the Antarctic menace:

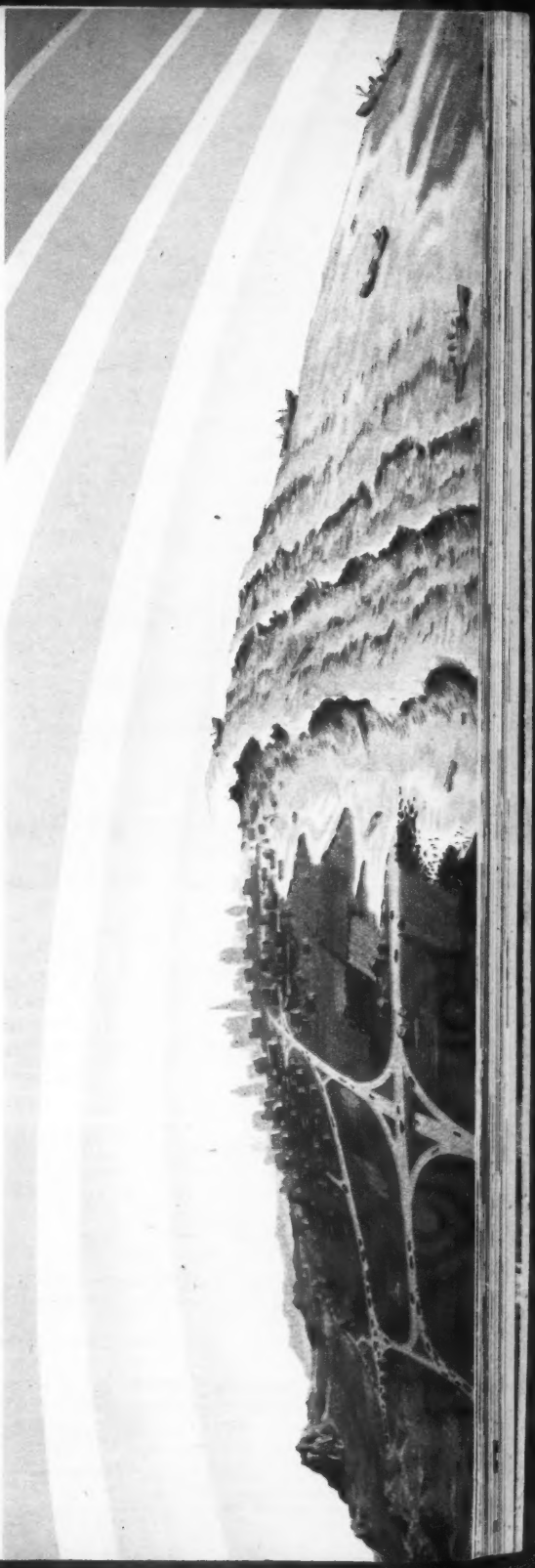
"Before the latest careen of the globe, there was no ice in the land of Antarctica. Since then, for approximately 8000 years, the icecap has grown slowly . . . until now it covers an enormous area and is pyramided two miles high at the South Pole. . . . This growing icecap has become a stealthy, silent, relentless force of nature and is the glistening menace, the creeping peril and divinely appointed executioner to the civilization of our epoch of time."

With the shift in the earth's axis, Brown contends, much of the world will be flooded. Perhaps the only survivors will be the Eskimos—if they can adapt themselves to a sudden switch to the tropics.

After the New York engineer's theory was published, scientists of the U. S. Geological Survey scoffed at it. They said they doubted most strongly that any existing polar ice masses were likely to tip over the globe. Further, they declared, if there were indeed such a threat, atom bombing would not make much of a dent in the ice.

Brown took this criticism calmly, and remarked that no prophet of doom is ever popular. And he went on to give the details of his plan to preserve the earth as we know it.

"First," he says, "we must make a careful survey of the antarctic ice, which would cost in the [*Continued on page* 79]



If the weight of the polar ice suddenly tips the earth, the oceans would slosh from their beds like water in a jostled cup and flood low continents. Tropics would quick-freeze in a new Ice Age.

A MONEY-MAKING

idea

Rabbits are more versatile than you think! Pelts of animals like the one above go into the making of the Royal Chinchilla cape, right, priced at $150.

Rabbits Multiplied My Income

By Thornton W. Price, Jr.

as told to

Grant and Marjorie Heilman

WHEN a Midwestern farmer recently wrote to ask me the cost of a chinchilla rabbit, I quoted him a price of $44 for a trio of fine breeders.

Astonished, he replied by return mail. "I don't want no horse, please, just a rabbit!"

He didn't realize that four females, weighing 10 to 12 pounds each, will produce more edible meat in one year than a 1000-pound cow. Neither did he fully realize the value of Royal Chinchilla coats.

My rabbit business began about seven years ago in a vacant corner of the garage. Today it occupies eleven buildings with about 15,000 square feet of floor space.

When Dad retired from the electrical business in 1940, he was intrigued with the idea of raising some sort of small animal on a commercial basis. For months, textbooks and government pamphlets cluttered the house. The final decision was to give rabbits a try.

A corner of our home soon housed six angoras, six New Zealand whites and six chinchilla rabbits. After a year of experimenting, we made up our minds to specialize in chinchillas.

Incidentally, these chinchilla rabbits bear little resemblance to the very rare South American chinchilla, except that the furs look alike when processed. The latter must live in specially-heated quarters, require delicate handling, cost about $1000

Physical inspection for a two-month-old bunny. Hutches are simple, wire-covered, wooden frames stacked three deep in Price's unheated buildings.

a pair and produce about four offspring a year. My finest chinchilla rabbits cost about $30 a pair, require no special handling and produce an average of 30 young a year.

Our garage business quickly overflowed into our chicken coop. Since then, we've added eleven buildings and they're almost filled to capacity. I decided our rabbit population should stay between 1500 and 2000 and we haven't increased the number since that time. Nevertheless, I think our farm—Willow Brook Farm, Inc. in Sellersville, Pa.—is now the largest chinchilla rabbit farm in the world.

In spite of its size, however, one man does all the feeding and cleaning for all the rabbits. We figure it takes him less than four hours a week to feed each group of 150 rabbits and clean the hutches which house them. The animals are easy to care for and simple to handle. Given a fair standard of sanitation, they have no serious trouble from disease.

Our rabbits have three separate marketing values. The pelts, the meat and the live rabbit—all are money-makers.

No other fur is used as much as rabbit fur, from which over half the fur coats in the country are made. Suitably tanned, clipped and dyed, rabbit fur shows up in shops under dozens of exotic names. Most good felt hats are also made of rabbit furs.

At first we sold the skins directly to large fur dealers who grade them and resell them to manufacturing furriers. But a couple of years [*Continued on page* 164]

Skinning a rabbit is an easy job, above—just pull it off. Then, pelts are stretched on a wire frame, below, and hung in a dry attic for a few days before they are graded.

Plywood Helicopter

Ever ride in a flying Easter egg?

Shock of power-off, emergency landing can be sustained by retractable, tricycle landing gear.

Photos by Ross-Pix

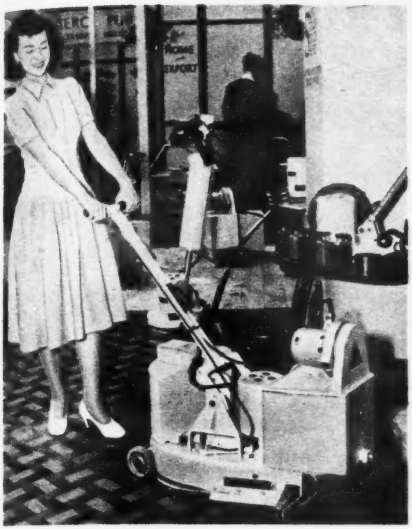
THERE'S an Easter egg in the sky! But it's the "Flying Easter Egg"—a new single-place helicopter called by that name because of the oval shape of its plywood fuselage. (See cover.)

Designed by Fred Landgraf, the H-2 can make 100 mph on its 85 hp Pobjoy engine. The center of gravity of the 850-pound craft lies *ahead* of the rotor axis, insuring greater stability.

Landgraf has stressed simplicity in his controls in order to appeal to a wider public—only stick and throttle action are necessary for flight. •

Inventor-designer Landgraf, below, checks the "spoilers" and ailerons on the tips of the rotor blades. They provide directional control. The automatic pitch control, left, allows the pilot to concern himself only with maneuvering the stick, the throttle and the foot pedal.

NEW for the HOME



Mechanical Scrubber not only applies soap solution to your floor and then scrubs it, but tidies up and leaves it clean and dry, too. The two-motored machine can cover 3000 square feet in one hour. Fraser Tuson Products, Kent, Eng.

Aluminum Awning is raised or lowered from inside the window by a crank attached to a stainless-steel cable. Here, Elizabeth Freeman sits in the shade of one of the rust-proof protectors. Spartan Awning Company, Los Angeles, Cal.

Will Polar Waves Swamp America?

[*Continued from page* 75]

neighborhood of $10,000,000. To raise this sum, and to carry on the work, I advocate the forming of a Society for Global Stabilization.

"The survey, I estimate, would take two years. Metereological stations would have to be set up in the Antarctic to determine exactly how fast the icecap is growing. At least three exploration ships, with skilled engineers and scientists aboard, would have to circumnavigate the ice mass.

"The final step would be the bombing of the ice at strategic points so that it could run off into the sea. Blasts probably could best be planted in mountain ranges on the edges of the icecap. Thus, they would break the dam that holds back the frozen peril."

Brown's hobby of studying the "careening of the earth" had its inception 35 years ago when he read about the discovery of huge, prehistoric animals in the arctic tundra and glaciers. Explorers found these mammoths frozen in lifelike condition, with food still in their stomachs and jaws. This indicated that their deaths had been sudden.

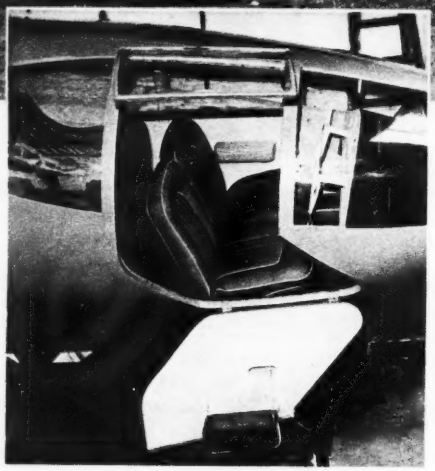
"The idea occurred to me that possibly the perfectly preserved mammoths found in arctic tundra and ice had been careened from a tropic to a frigid zone," Brown declared.

Taking land masses and particularly, mountain ranges into consideration, Brown calculated that before the last careen of the earth the polar regions must have been located in the Sudan Basin and in the region of Samoa in the Pacific. In the Sudan, he believed, the center of the icecap was at Africa's present Lake Chad, which became the North Pole of that epoch.

What happened in the last epoch, he says, can put an end to our present epoch.

You can heed Engineer Brown's warning and get ready for Doomsday. Or you can take your chances with the U. S. Geological Survey scientists who think that this old troubled world of ours will keep rocking along despite all that polar ice. •

Tail-Prop Plane

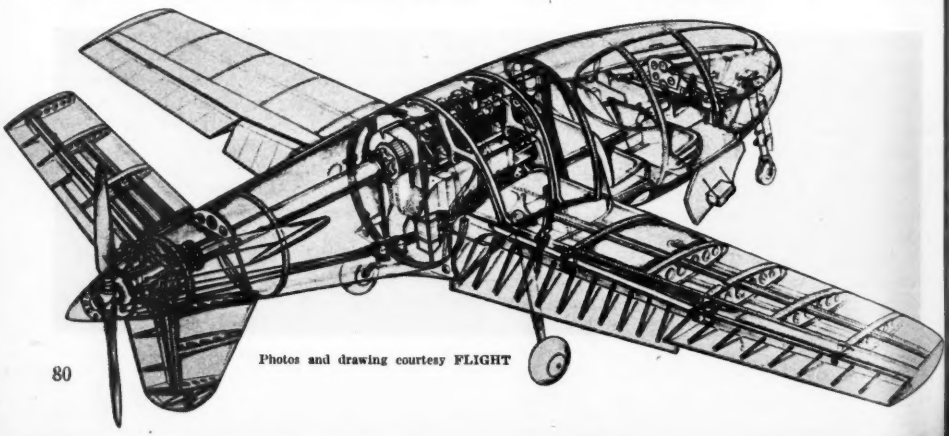


Cabin is as roomy as an automobile. Seats are set directly on the floor with foot wells for passengers. Door has combination step and armrest.

A new style in tails has been shown recently to British fliers by Planet Aircraft, Ltd.

The plane, called the Satellite, has a tail prop, V-shaped stabilizers and an inverted fin. The engine, a Gipsy Queen, is mounted directly over the center of gravity and is linked to the prop by a magnesium shaft. A soundproof bulkhead separates the 5-passenger cabin from the engine compartment. Thus all prop and engine noise is directed backward and the cabin is virtually noiseless.

Construction is magnesium instead of aluminum; this metal reduces corrosion and fire hazard. Flaps give it a landing speed of 62 mph. Top speed is 208 mph—not bad for a lightplane!



Photos and drawing courtesy FLIGHT

Hurry-Up Home

Castle in the air? Here's the first step after the arrival of seven sections. A crane lowers the unit into place on your foundation.

PREFABRICATED houses are old stuff. But when a manufacturer comes along who can put up a prefab, from start to finish, within two hours—that's news!

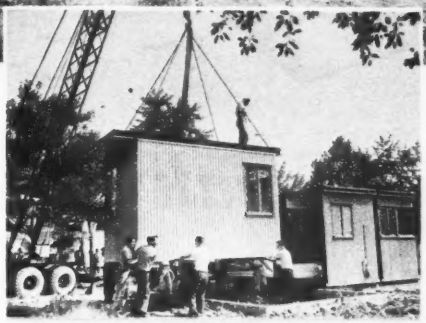
Reliance Homes, Inc. of Lester, Pa. will deliver a modern, six-room house, complete with everything but furniture, to your lot. All you do is supply the foundation—and the $6000. Then, two hours after the arrival of five trailer trucks, the factory-built house is ready to live in.

It's delivered in seven finished sections, each complete with wiring, plumbing, closets and incidental equipment.

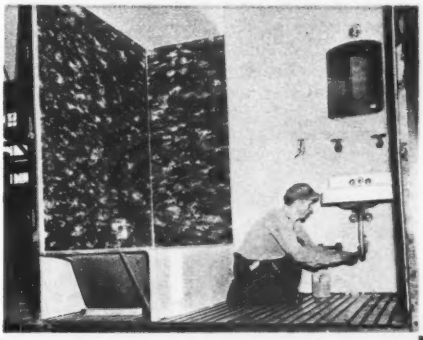
The floor plan includes a living room-dining-room combination, three bedrooms and a modern kitchen and bathroom—all on 850 square feet of floor space.

The house has a rigid steel structure with the exterior sheathed in aluminum. Floors and roof decks are ribbed light steel plates. An oil burner provides cheap heat.

Got your site picked out? OK—now get busy on the 6000 bucks. •



With the installing of the third section, it begins to look like a home. The modern aluminum exterior has steel casement windows.



Bathroom arrives as a complete unit. There's nothing for the plumber to do except tighten a few bolts and connect the water pipes.

TWO-HOUR WONDER: here it is—the 120-minute, hurry-up home—ready for occupancy. These houses are available with either flat or peaked-roof styling.

"Be certain not to break the eggs," Mrs. Bowie warned. So, Stuart Bowie of Rochester, N. Y. eased his auto carefully over a railroad crossing to make sure he didn't break any of the two dozen he was taking home. A freight engine bore down on him, struck his car and knocked it into the path of another locomotive on an adjoining track. Mr. Bowie crawled from the wreckage bruised, dazed and worried about the eggs. When he saw that not one had broken, he breathed a deep sigh — and keeled over.

CARTOONS BY CHIC STONE

Freak Squeaks of '48

YOU lug home an oversized sack of groceries for your wife after a hard day at the office. It's heavy, so you plunk it down on the kitchen table with such energetic relief that a protruding stalk of celery pokes you in the eye. You're blind in one eye for a couple of weeks, it kills your golf game and you're losing money at the office all the time. But your friends giggle when you tell them how it happened. Ralph Joynt of Mason City, Ia., can tell you that story.

The year 1948 produced its share of such strange accidents. They're amusing in a morbid sort of way—these freak squeaks of '48.

Material courtesy PUBLIC SAFETY, National Safety Council

Dennis Plumb of Atherstone, England, is bitter, too. He always dreamed of being a red-hot cricket player and one day he had his chance. A hard-hit cricket ball struck a box of matches in his pocket. Pants afire, fielder Plumb completed the play and dashed from the game in a blaze of glory.

And speaking of ball games, Miss Estelle Hester of Los Angeles is really cold to the charm of the Great American Pastime. She was washing her car across the street from a ball field in Los Angeles when a batter socked a home run over the centerfield wall. Miss Hester caught the ball smack on the head. The batter wasn't out but Miss Hester was—cold!

Mrs. Alfred Swauger of Ravenna, Ohio, has one to tell, too. She was baking sweet potatoes for the family and opened the oven to take them out. Wham went the yam—right in Mrs. Swauger's face!

Never swat a cockroach on an open

Benjamin Quinland lay uneasily in his hospital bed in St. Louis. Although he made a very restless patient, the nurses didn't blame him at all. For as he had napped at home a short time before, a bedspring had snapped loose, pierced the innerspring mattress and stabbed poor Mr. Quinland—right in the middle of his nap!

"You're on now, Mr. Steffe," the boy shouted as he knocked on the dressing room door of singer Edwin Steffe. He hastily clapped his wig on his head for his part in an outdoor St. Louis Municipal Opera Co. production. That quick swoop trapped a bee beneath the wig. Many critics said Mr. Steffe gave the most animated performance of his career.

road. That's a rule Lawrence Doorey of Brisbane, Australia, will follow. He spotted the roach on the sidewalk and stomped at it with his boot. He missed and the little creature fled into the street. Mr. Doorey pursued it relentlessly. As he bent over to take another swipe, a passing auto whacked him from behind. The roach is doing very well, thank you.

If you're dubious about the danger of cigarettes, James Drager of Beloit, Wis., can tell you a story which will really curl your smoke. He placed his lighted cigarette on an ashtray and settled back to read his paper. Some thoughtful soul had left a bullet in the tray and the cigarette set it off. Mr. Drager was shot in the arm. If you want a treatment instead of a treat. . . .

In regard to bloodthirsty, inanimate objects, Ed Taylor of Matewan, W. Va. had an experience with a head-hunting steam shovel that would scare a native of the Solomons. As Mr. Taylor parked his car, the boom of a nearby clam-shell power shovel swung around and knocked down a utility pole. A network of telephone wires fell on top of Mr. Taylor's car. As he stuck out his head to see what was going on, the clam shell banged down, snapped its jaws and locked Mr. Taylor's head and shoulder inside the bucket.

Mr. and Mrs. Joe Duhachek picked up an interesting hitchhiker near Meadow Grove, Neb. A jackrabbit crashed through the windshield of the auto, whizzed by the occupants and banged into the rear window. Mr. and Mrs. Duhachek were startled but unhurt.

The rabbit couldn't take the excitement, though. He fell dead in the rear seat!

Winter weather is always good for a couple of close calls. The Knott family, in Stamps, Ark., were victims one icy day. First, Mrs. Polly Knott slipped on the ice and sprained her ankle. Her sister, rushing to the rescue, fell and broke her wrist. The sister's son, Clint, dashed out to help. Yes, he slipped too, and broke his leg. The Knotts were fit to be tied!

Advertisers who are skeptical about the effectiveness of roadside signs please note what happened to Mr. and Mrs. Roger Clark. They would have plunged over a 50-foot embankment in Portland, Ore., if their car hadn't struck a sign and stopped. The sign said: "Drive carefully and avoid accidents."

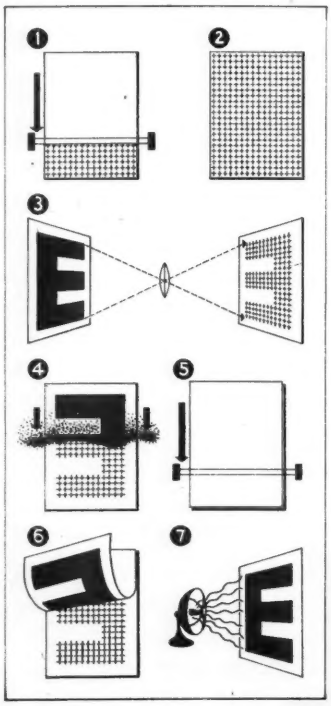
Accidents aren't really funny. They just seem that way—especially when they happen to somebody else. •

Puss was sleeping next to the gas stove while Miss Melle Boussurois cleaned her clothes with gasoline. The cat got too near the burner, caught fire, leaped smack into the bowl of gasoline and rocketed off in a burst of flame. Miss Boussurois didn't have to put the cat out—it went out entirely on its own that night!

Printing Without Ink

Powder instead of ink is fed into this experimental "press" designed for high-speed Xerographic printing.

Here's how one man beat the high cost of printing by inventing Xerography—a new process which requires no ink, rollers or heavy presses.



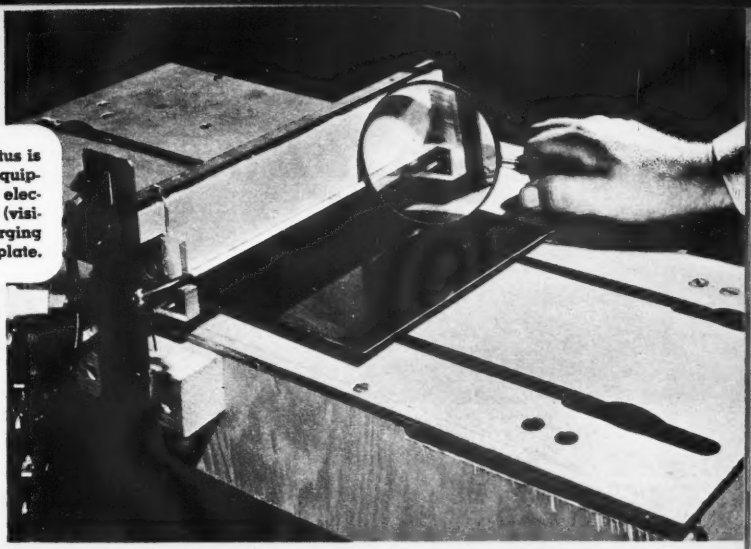
CHESTER CARLSON, patent attorney, wanted to have one of his manuscripts published but the cost astonished him. It started him thinking about methods for reducing printing costs. And what's more important, it started him experimenting.

Soon he found it essential to ask for financial help. The Battelle Memorial Institute of Research with the sponsorship of the Haloid Company, came to his rescue. The result? Well, it has just been announced that a revolutionary process of inkless printing has finally been developed. It's expected to change radically most printing and publishing operations.

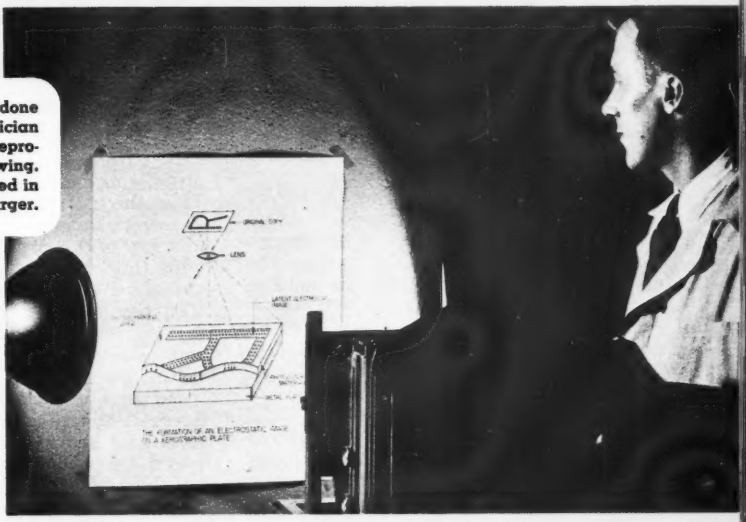
Named "Xerography," the method reproduces pictures and text at a speed of 1200 feet within 45 seconds after exposure of the photographed material. It substitutes for liquid ink a fine, iron powder mixed with a dry plastic substance.

With the prospect of terrifically reduced printing costs, inventor Carlson feels he has really accomplished something. Says he might even publish a manuscript, now. •

Here's how it works. 1 & 2: Surface of coated plate is electrically charged as it passes under wires. 3: Copy is projected through lens in camera. Light releases charge, leaving electric image. 4: Negatively-charged powder sticks to positively-charged image. 5: Sheet of paper is placed over plate and receives positive charge. 6: Positively-charged paper attracts powder from plate, forming direct positive image. 7: Image heated to fuse powder into print.



"Corona spray" apparatus is the only specialized equipment needed. It sprays electrons from the fine wire (visible through the enlarging glass) and sensitizes plate.



Need a printing job done cheaply? Here a technician prepares to make a reproduction of a line drawing. The plate may be exposed in a camera or under enlarger.

In demonstration setup a finished print made by the new inkless process is being stripped from plate. Xerographs may be made on paper, wood, glass or metals.

He Made It Rain—and How!

WEATHER PROPHET: fabulous Charles Mallory Hatfield scans the sky for signs of rain.

By William Tusher

LONG before modern rainmakers took to thawing out the clouds with dry ice, a man named Charles Mallory Hatfield did quite well at his trade of downpour-coaxing. He sold rain—at $1000 an inch!

Hatfield never claimed to have occult powers nor did he hold his rainmaking faculties to be infallible. Whenever he undertook to bring rain, he insisted on written pacts with the customer: no rain, no pay.

Now an elderly man, living in retirement at Eagle Rock, Cal., Charles Hatfield has yet to reveal the secret of his genius. This much is on the books, though—he did not invoke mumbo-jumbo or indulge in pseudo-religious ritual.

His 20-foot towers and square, chemical-filled boxes were there to be seen by all. They were the only props he used, raised on elevations in order to get them as close to cloud formations as possible.

Time and time again, amid the catcalls of skeptics, Hatfield erected his towers and mixed his chemicals. And time and time again, the rains came. Rain fell in San Fernando Valley, for three years running in San Jacinto Mountain region and in parched Yukon. But it was in San Diego that he was put to his severest test.

RAINMAKING TOWER: this is an authentic photo of all the equipment Hatfield used.

In 1916 San Diego was bone dry. Its crops were periled and its people in panic. True, the city boasted an 18-billion gallon reservoir, but there was no water in it.

A few of the city fathers decided to deal with Hatfield. Despite his long record of successes, they did not regard him highly. Yet they realized he was their last hope so they hired him to fill the reservoir. It was an enormous job but they promised a fine fee—$10,000. Hatfield took it on.

He went to work in his methodical manner and—the rains came. Rapidly the water level rose in the San Diego Dam. Soon it was filled to capacity and still the downpour didn't cease. The storm matured into a full-fledged flood—the famous San Diego flood of 1916!

Alarmed city officials turned to Hatfield for relief. Calmly, he reminded them that his forte was starting rain, not stopping it.

When the flood finally subsided, the councilman who made the agreement acted strangely. He asked Hatfield if he felt he had earned the $10,000 fee.

"Of course," Hatfield replied. "I said I would fill the reservoir and I did."

Solemnly, the politician reached into his briefcase and withdrew a legal document. "In that case, Mr. Hatfield," he said, "you leave me no alternative. Since you admit responsibility for the flood, the city of San Diego is making a claim for damages caused by you—ten million dollars!"

(EDITOR'S NOTE: *neither San Diego nor Hatfield ever collected.*) •

THIS MONTH'S

prize gadget

Automatic Tape Pistol

"DON'T dirty up those windows!" the woman said.

Ferris Griffith looked up from the ice-cream cooler he was repairing in the candy store at Wheeling, W. Va. A cigaret salesman wanted to paste up his signs on the windows.

"Hard enough to clean without messing them all up with paste," the woman who ran the store complained.

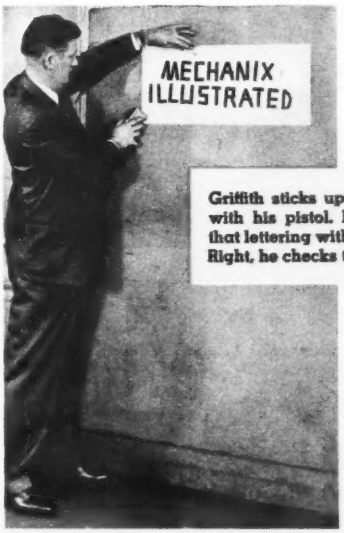
So the salesman got some cellulose tape and climbed on a chair with his signs. He tore off a piece of tape, then a string of cuss words as the sticky stuff clung to his fingers. The poster slipped, the bits of tape kept sticking to the wrong places and the salesman kept getting madder, nearly kicked the chair through the window.

"Hm-m," said Griffith. "Should be an easier way to tape up a sign."

After months of tinkering with the idea in his home workshop, he finally found that easier way. He turned out a fully automatic tape pistol, which a new firm, Ferris Products, Inc., of Cleveland, is marketing. Just pull the trigger and the pistol shoots out the tape exactly where you want it, then cuts off the right length—all with one hand. His sharp-shooting tape gun scored a $50 hit with MI as this month's Prize Gadget—and may soon bag him a big fortune in royalties. •

WIN $50

Dreamed up a neat gadget? If you're pretty keen about that pet project of yours, get busy and work it out in your shop. Then send pictures and a description of your invention to Gadget Editor, MECHANIX ILLUSTRATED, 67 West 44th Street, New York 18, N. Y. Each month the best entry, in the opinion of MI's editors, will be awarded a cash prize of $50.



Griffith sticks up an MI poster with his pistol. He clicked off that lettering with colored tape. Right, he checks the gun's load.

Sun glare, not worry (says Bill), caused frown during his "no hands" experiment.

Who's Afraid of Motorcycles!

"They'll never get me on one of those things again," vowed MI's Editor after a wild ride 20 years ago. But look what happened!

By William L. Parker
Editor of MECHANIX ILLUSTRATED

ONCE upon a time, when I was much younger and somewhat sillier, I thought it was wonderful fun to careen around the countryside on the back end of a big, blue, four-cylinder motorcycle owned and operated by a friend whose nickname—so help me—was Hairbreadth Harry. He was never quite hairbreadth enough to let me handle the two-wheeled monster myself. But I liked being a passenger and we made several cross-country trips together.

And then one day we were tooling along the highway between Washington, D.C. and Charlottesville, Va., at about 55 miles an hour, when a bee flew up Harry's pantleg and stung him on the—well, on the beehind, I guess. He let out a pained yip and at that moment the white line in the middle of the road began twisting and coiling like a boa constrictor with the DT's, as Harry tried to eliminate the bee without eliminating his motorcycle, the oncoming traffic, himself or (as a last consideration, I am sure) his palpitating passenger—me. Trees, fences, automobiles, clouds, chickens, Danger—Go Slow! signs and everything else in the vicinity all merged together like a boarding house hash. I was, shall we say, a trifle uneasy. In other words, scared stiff.

Well, we made it all right and nobody got hurt. But shortly after reaching Charlottesville I remembered an urgent appointment back home and I proceeded thence forthwith—by train. And for twenty years I made good my fervent oath, "They'll never get *me* on one of those things again."

Even an editor's office muscles can manage the Arrow's 245 pounds at 45-degree tilt.

After only an hour's practice, Bill had no qualms about taking the Indian through dense traffic on the busy Boston Post Road, above.

That may give you an inkling of what went through my mind when we at MECHANIX ILLUSTRATED decided to do some articles on motorcycles and I was elected to write the first one. I didn't like motorcycles. I thought they were noisy, dangerous devices of the devil. I had no more desire to ride one, nor confidence in my ability to do so, than I have right now in learning to become a lion tamer.

So that made me the logical candidate for the job. We wanted to find out if the publicity boys were telling the truth when they claimed that "*anybody* can learn to ride a motorcycle." We figured that if I could learn, anybody could learn.

Before I could change my mind and cravenly turn the assignment over to somebody else, a fellow named Walter von Schonfeld from the Indian Motocycle Company rode out to my house in Mamaroneck, N.Y. on one of the new lightweight, single-cylinder Indian Arrows. At about the same time two other MI editors, Larry Eisinger and Bob Brightman, showed up with a handful of cameras and an overwhelming curiosity to see yours truly on a motorcycle.

Being the host, I graciously let Larry and Bob ride the Arrow first—especially since they had ridden other motorcycles before. Walter showed them how to start, shift and stop, and they took turns circling around an empty parking lot. They both looked calm and untroubled. Just as if they were having a dandy time. I watched, lost in my own unhappy thoughts.

"Nothing to it," Walter was saying. "Why, you know, last week I taught a nine-year-old boy to ride—in five minutes. Then we taught a seventy-seven-year-old man. He was crazy about it."

He had me bracketed there. Nine years old. Seventy-seven. That put me right in the middle. At that moment Bob Brightman rode up beside us, came to an expert stop and put me in the middle for fair by saying:

"Your turn, Bill."

Too late to be a coward now, I grinned back at him somewhat weakly and took his place on the seat. The engine was put-putting only about a quarter-decibel more noisily than my heart.

"Depress the clutch," Walter said, pointing to the hand lever on the left handlebar. I squeezed it toward me. "Now—" indicating the foot-controlled gearshift

Tip-toe gear shifting is a feature of Indian motorcycles. To go into first, depress the hand clutch and kick down on foot gear lever, above. To shift into second, third and fourth (overdrive), you put your toe under the lever and pull upward, below.

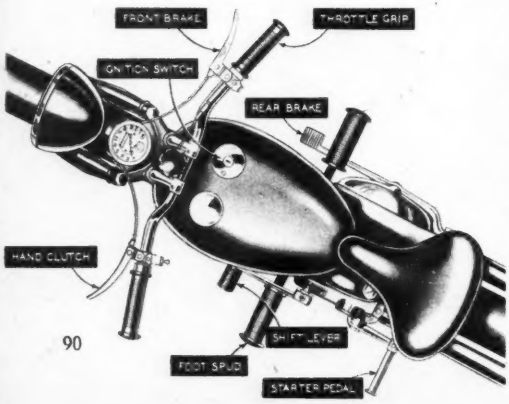
Indian's telescopic fork, like airplane landing gear, gives five-inch cushion action, as shown here.

lever on the left side of the engine, "press down on that pedal until the indicator is opposite the figure 1." I did so. "Now you're in first. Let the clutch out slowly, give it just a little gas and you're in business."

I let the clutch lever slip forward slowly, twisted the hand throttle toward me by bending my right wrist slightly, and waited for the Arrow to take off into the stratosphere. It didn't. Instead, much to my amazement, it moved forward slowly and smoothly—just as if I knew what I was doing with it. Walter loped along beside me, offering advice.

"Let your feet hang free until you get the feel of it," he said and I rode along, so slowly the speedometer didn't even register, with my legs dangling like a kid riding a horse bareback.

I reached the far end of the parking lot and tried a wide, slow, left-hand turn. Instead of jumping out from under me, or maybe bucking me over the handlebars, the Arrow turned easily. For the first time I felt a vague twinge of confidence. I twisted the throttle a little further toward me—the entire throttling range, from idling speed to wide open, is only a quarter-turn of the handle grip—and the Arrow picked up speed. Walter stopped running and stood still, watching, as I made another circuit of the parking lot.



Within less than five minutes I was making right-hand turns—which for most people, Walter says, are less natural than left turns—and had shifted through all four gears. To go from first into second, third and fourth (or overdrive) you put your toe under the shift lever and pull up on it, depressing the clutch and the throttle during each shift. It's a little awkward at first, and tough on a new shoeshine, but not difficult to learn. Better than a hand gearshift? Frankly, I don't know.

We all took turns riding around the parking lot again. Then Walter said, "Well, I've got to get back to New York. Keep the bike as long as you like. Ride it around, get used to it." He explained that my automobile driver's license entitled me to operate a motorcycle (a fact which rather surprised me) and then he took off for the city with Larry and Bob. I watched them depart with somewhat the same emotions, I imagine, of a brand-new bride who agrees to mind the neighbors' baby for the weekend and regrets her rashness the moment the parents are gone.

Caution prompted me to give the Arrow a dry run before I took it out on the road alone. I straddled the machine and rocked it from side to side, with my feet on the ground, to test its balance. The center of gravity of its 245 pounds must be very low and well placed because I could lean it away over to either side without losing control of it. I liked that.

Next I experimented with the foot gearshift lever. I found that although the scale beside the arrow-indicator is plainly marked, from front to rear, 1 N 2 3 4, you can't always be sure you're in neutral (and not first or second) just by looking at it. To make sure, you walk the motorcycle forward or backward a few feet. In neutral it rolls easily; in [*Continued on page* 151]

Gimmicks for Beauty

FEW girls are born beautiful. But many plain Janes are getting pretty enough to make a guy go ga-ga, thanks to the odd gimmicks beauty gadgeteers are turning out. To the male eye the strange beautifying machines look like modern versions of a medieval torture chamber. To milady the devices are the wonderful instruments that help nature transform the ugliest duckling into a lovely swan. Here are four of the new gadgets now glorifying the New York girl: (1) Black Ray machine, for banishing skin blemishes; (2) "chinning" device, to pick up that slack under the chin; (3) multiple-wave oscillator, to perk up nerves and glands, and (4) electrical masseur, to mold the waist into the form divine. •

1

2

3

4

English M. G. a Bit of O. K.

says MI's automotive expert, Tom McCahill, after pitting his Mercury against the British car. Tom was shocked to come out second best.

McCahill finds the M.G. low enough for him to scoop up a half-dollar from the ground.

I HAD my teeth kicked out, automotively speaking, on a recent run from Los Angeles to San Francisco.

For 300 miles I all but pulled the guts out of a 1948 Mercury, trying to stay with a feather-weight not much larger than a St. Bernard dog—a 1948 English M. G.

The M. G. with which I came to grips was the midget TC model now invading our shores at the rate of several hundred a month. California seems to be a popular spot for them at the moment. All the new M. G.'s that have been sent over since the war are two-seat roadsters which close up like convertibles. They have finely-tailored side curtains and tops. This has been a middle-class sport car in Britain for a number of years. Cars delivered in this country so far have right-hand steering wheels and controls.

The name M. G. is derived from the fact that many years ago the cars were manufactured in limited quantities by the Morris Garages. When this company was expanded and moved to its present Oxford factory, the M. G. was kept as an identifying name.

The M. G. sells for $2395 on either coast and if this seems like a lot, let's examine the facts. There are a surprisingly large number of automotive enthusiasts in this country who feel the same way about cars as connoisseurs do about boats, horses or even blondes. They love quality sport cars different than the family type that Joe Practical always drives.

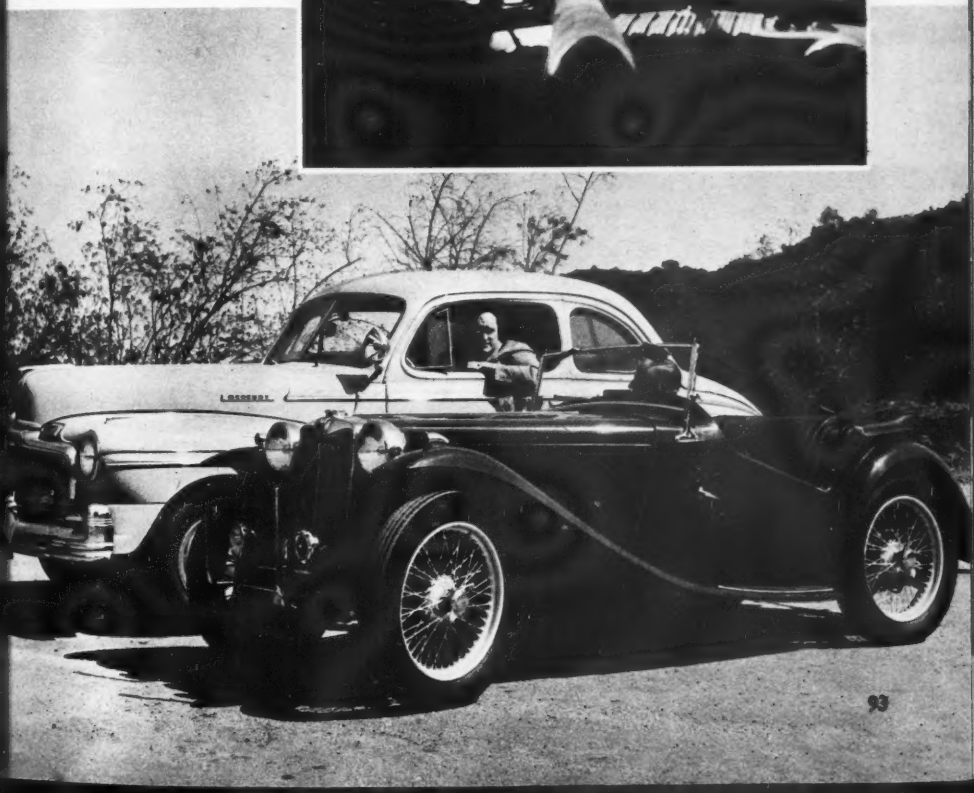
Unfortunately, we build nothing in this country to answer the demand. The Lincoln Continental and Cadillac offer twice the room and comfort of an M. G.—but get only about 11 miles to the gallon. The M. G. does better than 30 miles to a gallon and will run the ears off either of them.

The race started one morning as I was leaving Los Angeles on the way up the coast. I was cruising along at about 65 mph when I noticed a '46 Ford coming wide open behind me. A second later it whizzed by and right on its tail was a little fire-engine red M. G. Curious to know just how fast the M. G. was traveling, I opened the throttle wide on my Mercury. At 75 mph both cars were still leaving me and at 80 I seemed to be holding even. I kept my throttle open until I was doing 90 and closed in (note to California High- [*Continued on page* 153]

It's compact under the hood, too. The neat four-cylinder engine shares space with tool boxes, left.

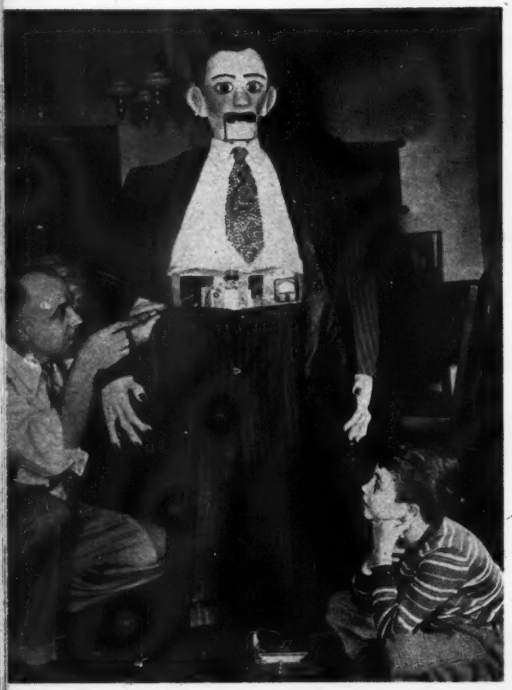
There's ample room behind the dash. Clock on the right is a tachometer, reading to 6000 rpm.

Zooming up ahead is the versatile little British M.G., right. Tom found it impossible to keep pace with the car and finally conceded victory to the "Midget Giant." Below, McCahill and Rummins line up on road for comparison test.



NEW in SCIENCE

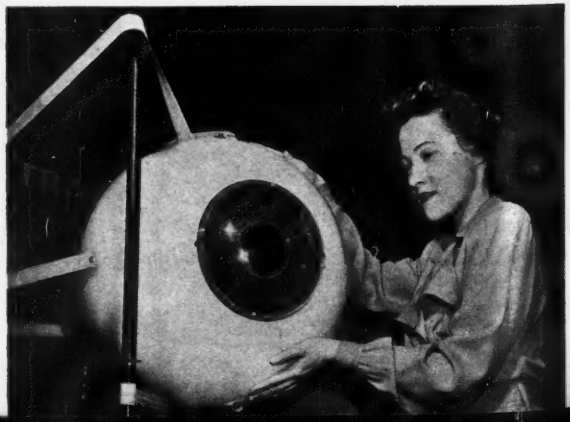
Bubble Doll blows beautiful soapy spheres when you press her stomach. She talks, too, when the pipe is out of her mouth. Effanbee Doll Company, 200 Fifth Ave., New York City.



Brassiere for Bossy will increase the flow of milk into her udder from 25 to 35 per cent. Invented by a Phoenix psychiatrist, the canvas bra has four elongated sacks which cradle the cow's teats.

Dancing Robot performs a merry jig by remote control. Patrick Rizzo who built it in his spare time, claims the $100,000 creature is the first of its type.

Giant Eyeball demonstrates the actions of the muscles which control your eyes. This plastic device is used in medical classes by the Air Force.



Edgar Bergen—Worker In Wood

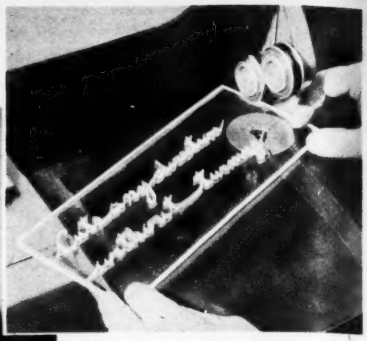
THE famous ventriloquist of radio fame is a woodworker in more ways than one! Not only does the stuff-that-trees-are-made-of supply him with his means of livelihood (in the "persons" of Charlie McCarthy and Mortimer Snerd) but it furnishes him with his hobby as well.

Edgar Bergen has a workshop that would make any serious hobbyist turn green with envy. It's complete with the latest convertible tools, sanders, lathes and drill presses. These he uses in his numerous household projects. But they come in handy when his two boy-friends get into serious trouble, too. Mortimer literally "lost his head" recently and Bergen needed him for a show. It was a simple matter to turn out a new one.

When interviewed by the press, Mortimer said, "Haw! That's one way of getting a-head." •

Bergen takes good care of his bread-winners. He's found a screw loose . . . in Charley's jaw.

NEW for the SHOP

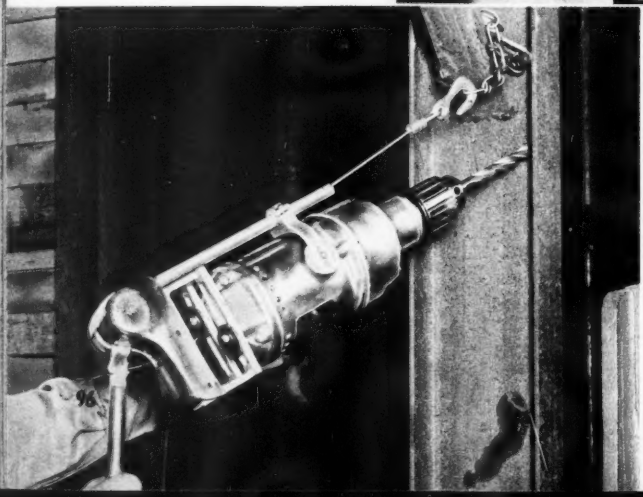


Spiral Bandsaw.

Intricate cuts, impossible to make with an ordinary bandsaw—or even with a jigsaw—are easy as pie with the revolutionary new spiral-blade bandsaw shown above and at left. It is produced by the Tyler Mfg. Co., Santa Monica, California.

Double-Ender.

Both regular and Phillips-head screws can be driven with the same screwdriver. Don't believe it? Neither did we before we were shown the duplex reversible-blade tool, right, that is put out by the Vaco Products Company, 317 E. Ontario St., Chicago, Illinois. This space-saver is obtainable in two sizes and is guaranteed free of flaws.



Pressure Galore

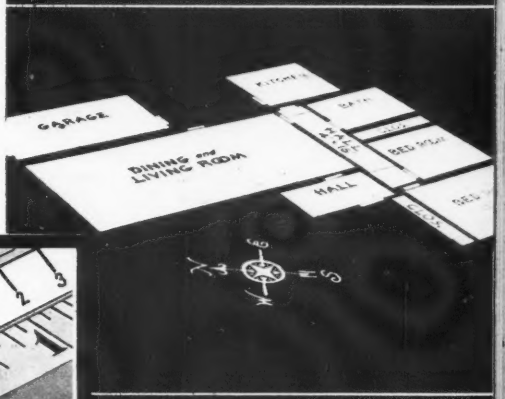
—to be exact, 500 lbs. pressure—can be applied to any portable drill by means of this handy thrust tool. It can be secured in about a minute to any electric drill up to 1-in. capacity. Saves time and prevents fatigue on all sorts of ordinarily difficult hole-drilling operations. E-Zee Pressure Tool Corp., Campbell, California.

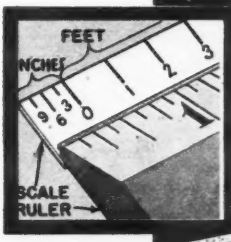
PLAN YOUR HOME With Cardboard

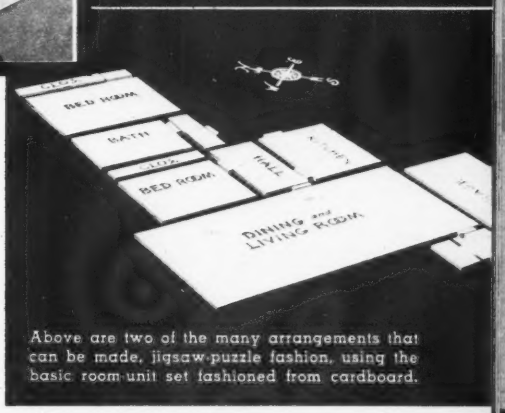
Is that "dream house" practical? Here's an easy way to find out.

By Carl W. Bertsch

Draw the rooms, halls, and closets to scale, label them, and cut them out. Six-inch strips (to scale) are used for doorways and windows.





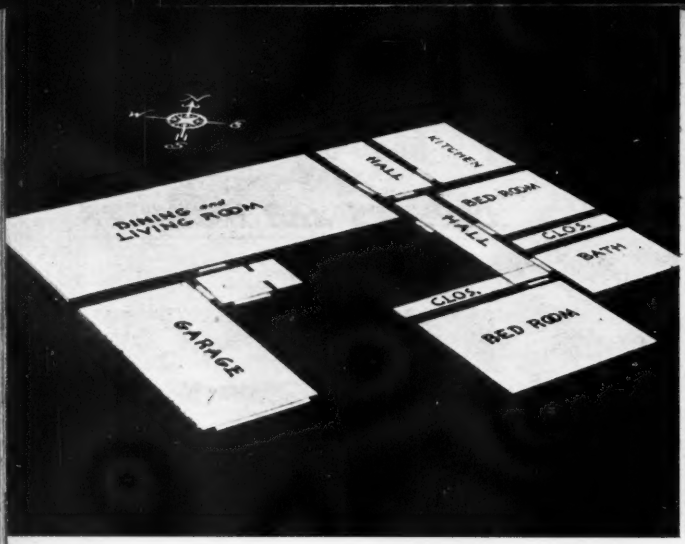


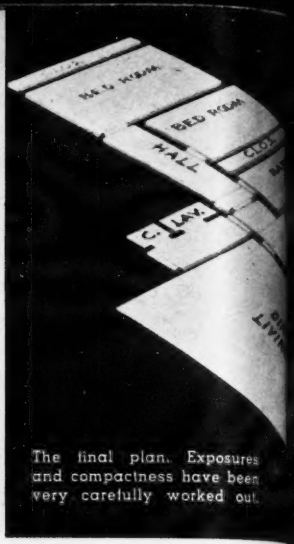
Above are two of the many arrangements that can be made, jigsaw-puzzle fashion, using the basic room-unit set fashioned from cardboard.

WE all dream of the house we'll build some day—a home tailored to our particular needs for gracious living. Today, building costs are sky high; so the ideal dream house would probably put one back a fantastic sum. It's a good idea, therefore, before specifying a 40-ft. living room, three baths, maid's quarters, and a full basement for your workshop and assorted hobbies, to take a gander at costs.

The latest approximate figure for a house built of top-grade materials by a contractor is $13 per square foot. This includes equipment, wiring, plumbing, and insulation. Furthermore, most contractors today won't quote firm figures, preferring to work on a cost-plus basis.

At $13 per square foot, a one-story house, 30x40 ft., would cost approximately $15,600. Such a house, which is typical of thousands





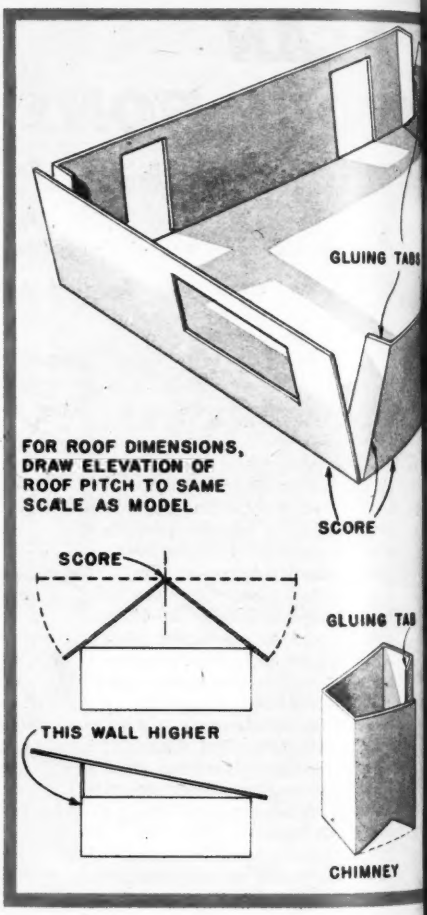
The final plan. Exposures and compactness have been very carefully worked out.

being built at the present time, would contain but five rooms and a bath; so you can readily see the necessity for careful planning.

Probably the best planning method for the amateur who isn't familiar with the use of drafting tools is the one described here. It involves cutting small replicas of the various rooms out of cardboard; then arranging and rearranging them (on a dark background, for contrast) until the best plan is evolved.

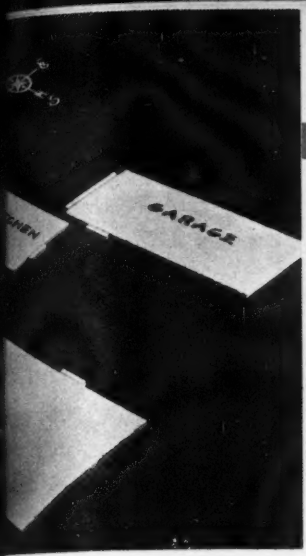
A scale is the first thing you'll need. You can easily make one, on which ⅜ in. equals 1 ft., from thin cardboard with the aid of a ruler, as shown in the drawing shown on page 97. With it, you can lay out a 60-ft. plan on a card table. A sheet of dark-colored cardboard, such as sign writers use, makes an ideal background for planning. Cut the rooms out of white cardboard and label them. Leave a space of 6 in. (to scale) between the rooms for walls. Narrow strips of cardboard serve to delineate door and window openings.

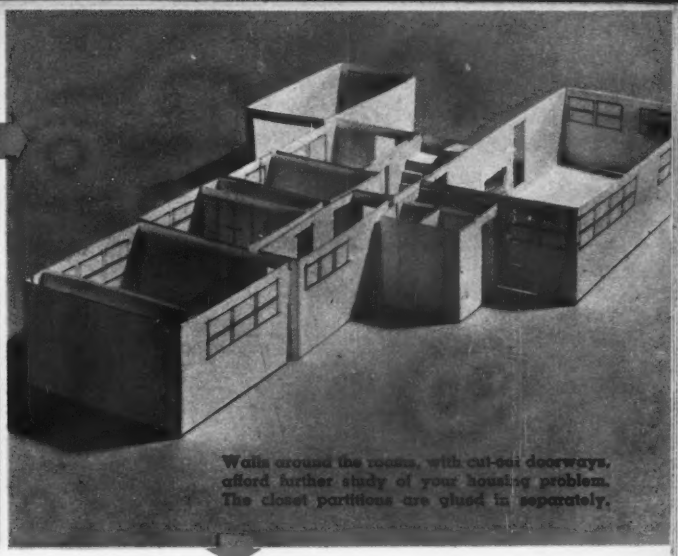
When planning a room, it's helpful to know how much space will be taken up by the various pieces of furniture and equipment that'll be used in the room. Using the accompanying list of furniture and equipment sizes, draw the various pieces as simple rectangles, to scale, on [*Continued on page* 148]



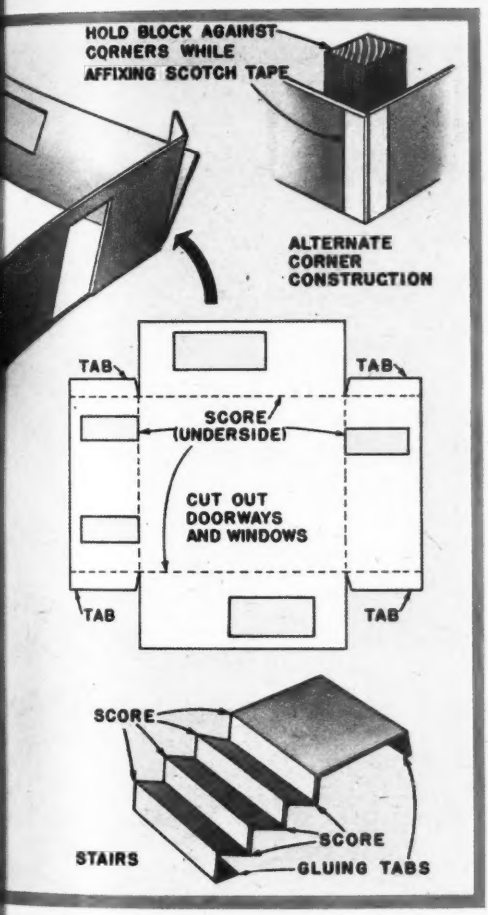
FURNITURE AND EQUIPMENT SIZES

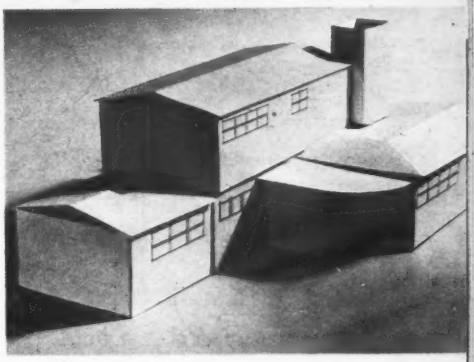
Console Piano	24x60 in.	Buffet	24x60 in.
Baby Grand Piano	60x66 in.	Double Bed	58x82 in.
Parlor Grand Piano	60x81 in.	Three-Quarter Bed	52x82 in.
Concert Grand Piano	60x108 in.	Twin Bed	43x82 in.
Piano Bench	16x36 in.	Day Bed	34x80 in.
Sofa	30x72 in.	Dresser	18x39 in.
Love Seat	24x42 in.	Dressing Table	18x36 in.
Club Chair	30x36 in.	Bench	12x18 in.
Barrel Chair	27x30 in.	Chaise Longue	28x60 in.
Wing Chair	32x32 in.	Stall Shower	30x30 in.
Straight Chair	18x18 in.	Bathtub	30x60 in.
Windsor Chair	24x26 in.	Square Bathtub	48x48 in.
Secretary	18x32 in.	Watercloset	23x28 in.
Desk	21x36 in.	Lavatory	18x20 in.
Card Table	30x30 in.	Corner Lavatory	16x16 in.
End Table	15x24 in.	Kitchen Sink	24x48 in.
Coffee Table	24x42 in.	Range	27x44 in.
Dining Table	36x60 in.	Refrigerator	24x30 in.



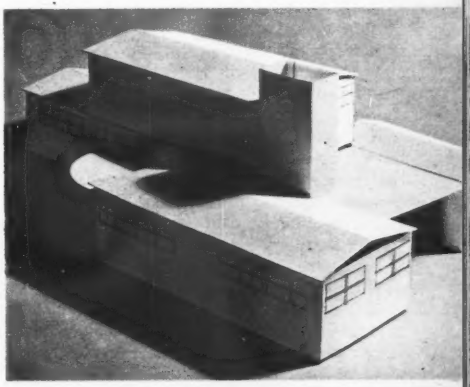


Walls around the rooms, with cut-out doorways, afford further study of your housing problem. The closet partitions are glued in separately.





Proper roof design contributes greatly to the appearance; so it should also be studied with the aid of cardboard cutouts. The advantages of a model such as this include the chance to study window placement, winter and summer sun angles, and depths of roof-overhang shadows.



Build a 1949 BUICK Convertible

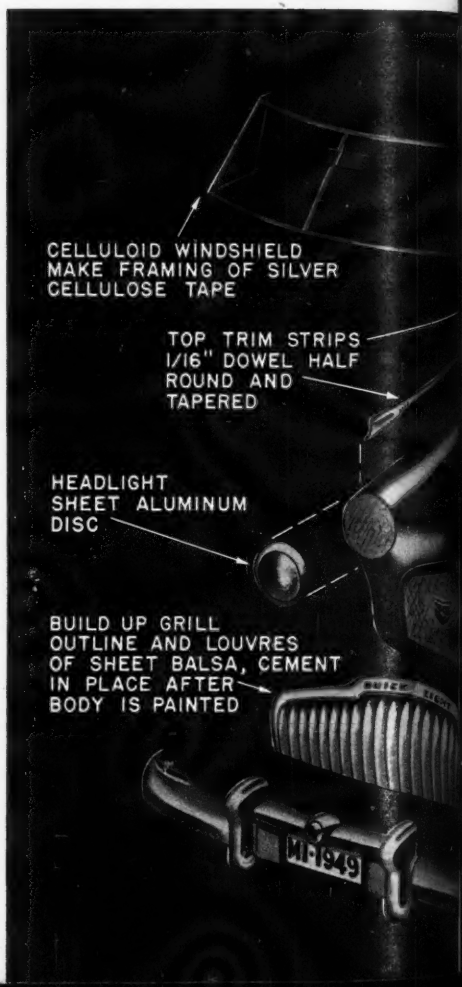
An electric motor driven 13 inch exact-scale model of America's most popular sports automobile.

By Larry Eisinger

LIKE that shiny new 1949 Buick Convertible you saw gliding down the road the other day? We think you'll agree Buick's '49 convertible is just about the sportiest car of this day and age—and what better reason could you want for owning an exact-scale ¾ inch to a foot replica? But not only does this model look like the real thing, it's a real performer too. Powered with a miniature electric motor driven by ordinary flashlight batteries, by a flick of a switch you have a choice of two speeds forward or reverse. What's more, the front wheels can be adjusted so the model turns either to the left or right!

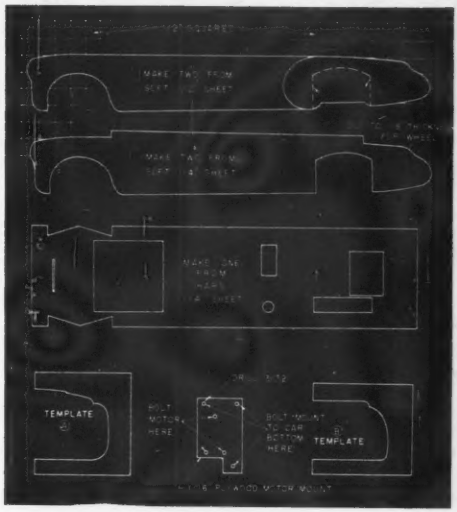
If you're a model builder, you won't have the slightest difficulty in duplicating this project and if you've never carved a block of balsa before, then follow the directions closely and you can't go wrong.

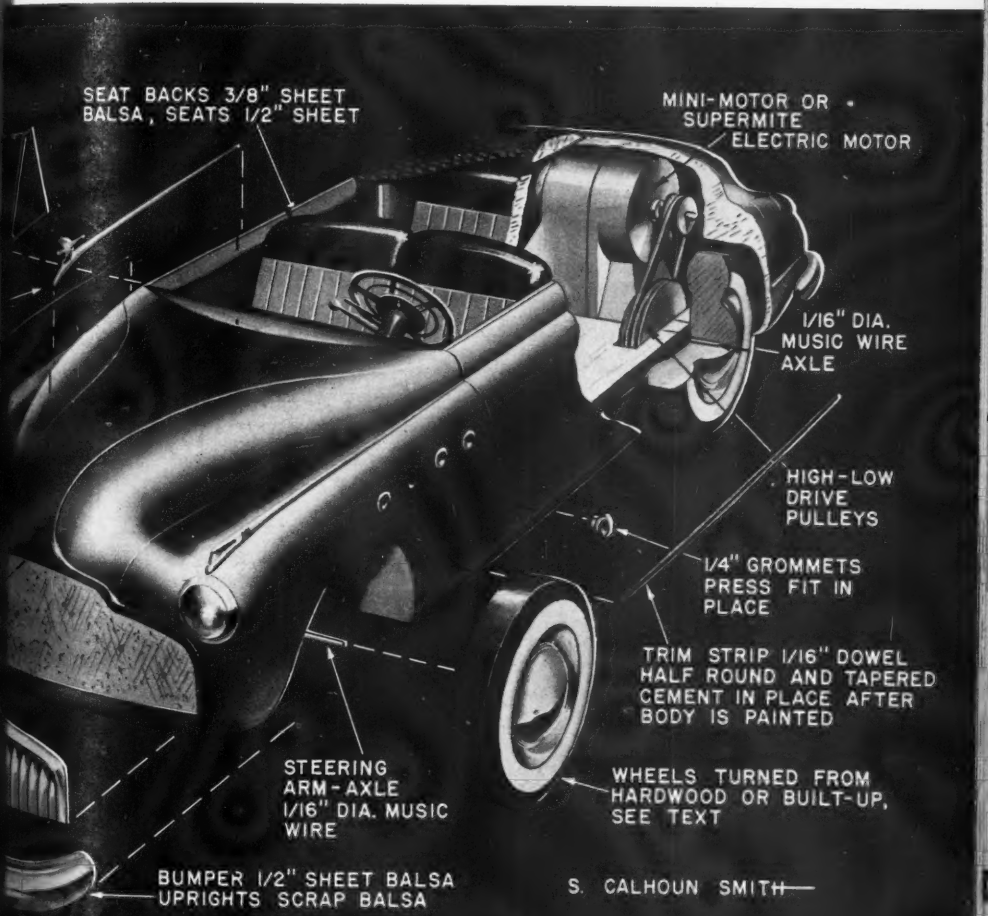
The primary step is to enlarge the plans to full size to permit tracing the various outlines on the prescribed balsa. Not only is balsa preferable for the body because it carves very easily, but it makes possible a very light model. And the less your model weighs, the faster it'll go.



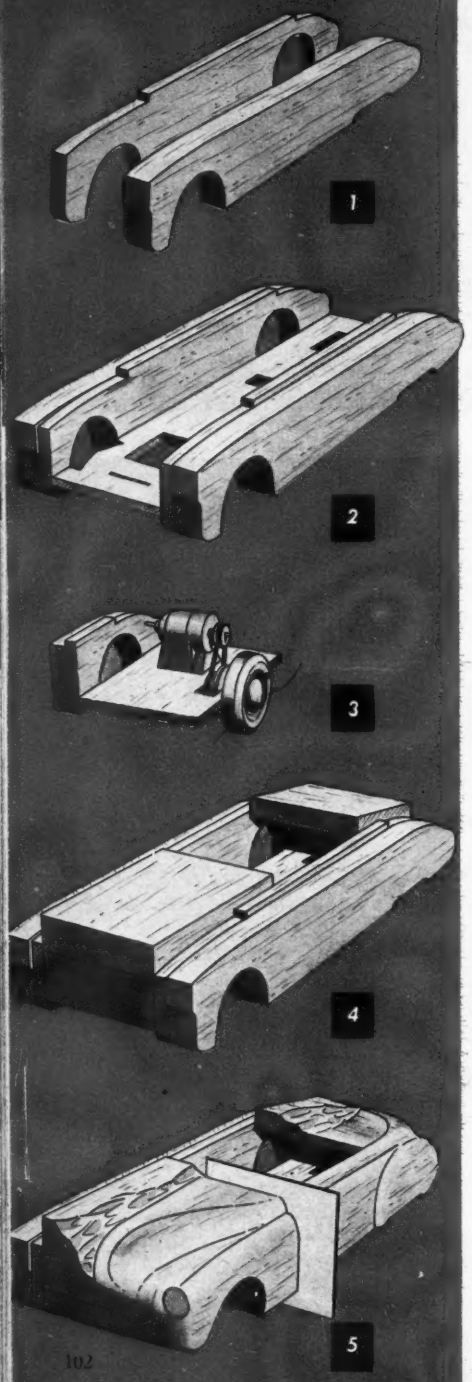
First, trace the outer body side, of which two are required, on a piece of soft ½ in. thick balsa. Allow about ⅛ in. outside the line and trim the sides to the correct width when you're shaping the body. Now trace and cut out two inside body panels from ¼ in. thick stock and cement each to the ½ in. thick sides, as shown in the drawings. When cementing these panels in place, note they make up the left and right hand sides of the body.

The bottom is now sawed from hard ¼ in. sheet, taking care so the various openings for the batteries, wheels and drive mechanism are as shown in the drawings. Once the bottom is shaped, pin and then cement the sides in place. Allow the cement to dry thoroughly and proceed to install the motor and battery box. You'll have much more freedom of movement by installing these parts at this time and you





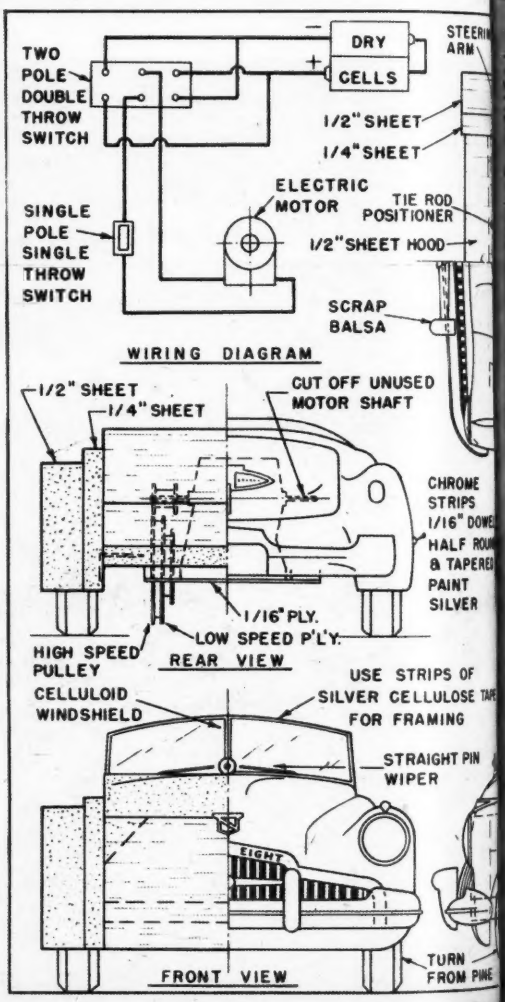
BODY CONSTRUCTION



won't risk marring the finish, as is often the case when wiring any model after the final coat of paint has been applied.

Once the ignition is installed, cement in place the trunk, hood and triangular hood filler block which are also of soft ½ in. balsa. Add the grill block onto which the grill is later cemented and you're ready for carving the outside to shape.

Now cut your cross-section templates from cardboard and proceed to carve down the exterior edges, checking the body shape at regular intervals against the templates. Note that the sides, when viewed from the top, are cut in slightly at a point between the front and rear fender. Plenty of sandpaper, starting with No. ½ and working down to 00, will produce the smooth flowing lines of the original. Finally, apply a coat of clear dope followed by a coat of



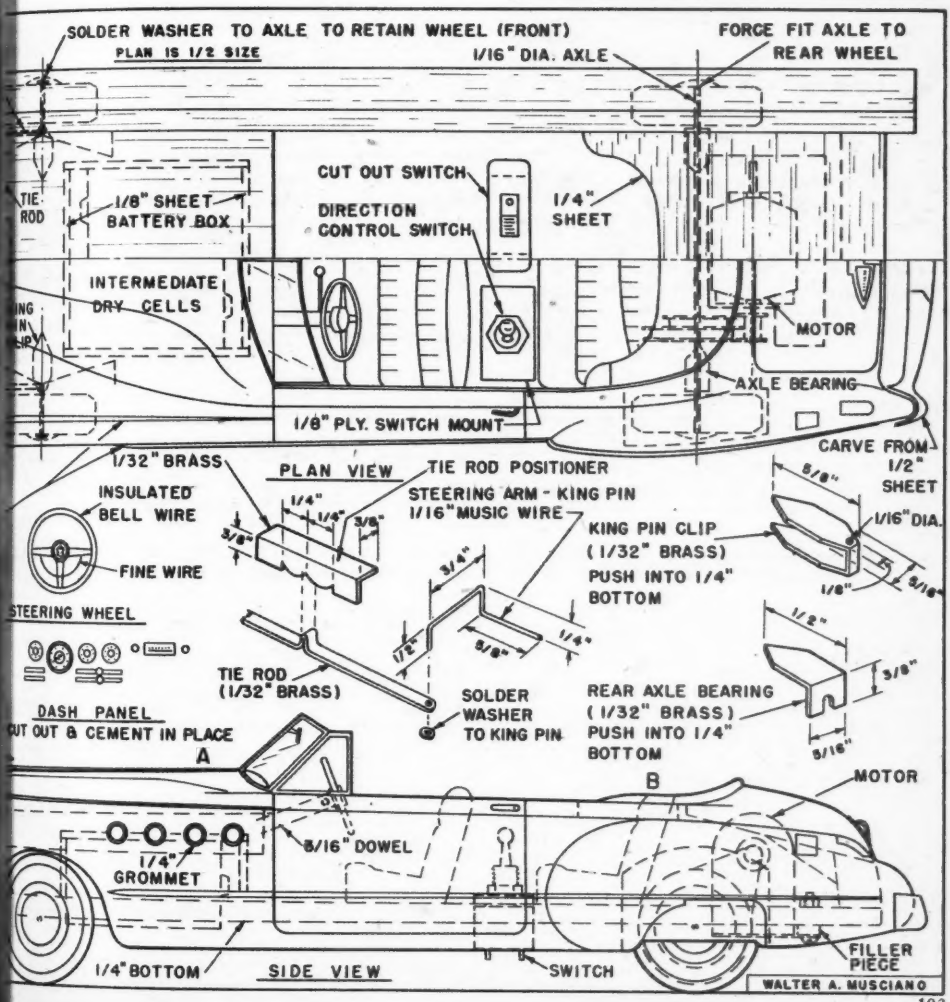
wood filler and set the body shell aside.

The wheels are next. These may be either built up from pieces of ⅛ in. thick sheet balsa cemented at right angles (laminated) or else turned from white pine on a wood turning lathe. If the latter is unobtainable you can adapt a drill press or any motor driven tool with a chuck. Simply chuck the wheel blank and, with the aid of a wood file and sandpaper, turn each wheel to shape. Drill the hub for the axle after the diameter is to size and simulate the rubber tire treads on the wheels by notching with a three-quarter file. Note the bottom of the wheels is flat and does not have tread marks.

Mount the rear wheels on the 1/16 in. diameter rod axles, using plenty of cement and a snug fit after the twin drive pulley is in place. [*Continued on page* 146]

Snappy, eh? Powered with Arpin's Mini-Motor, the original model had plenty of zip, was very stable.

FULL SIZE PLANS
of this model are available. Send 25¢ to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Connecticut. Please be sure to specify Plan No. 397A.



Radio-Phonograph Cabinet

Give your radio a "new look" and make space for a record player and several albums.

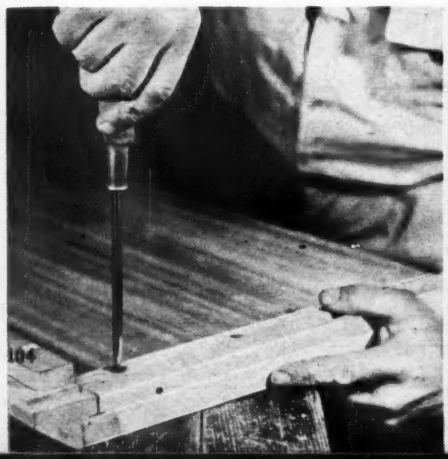
By Ralph S. Wilkes

THIS cabinet has lines that harmonize with nearly every style of furniture. The overhead-type radio door that disappears beneath the top is a unique feature. Dimensions of the cabinet may be varied to take your particular radio and record player. Because tonal quality is directly proportional to size of speaker, it is recommended that you install the largest speaker you can afford. Walnut or mahogany solid wood or veneered panels, ¾ in. thick, are used for all external surfaces. If you use solid wood, you'll have to build up the panels (fitting carefully and joining with ⅜-in. dowels and glue) because they are too wide to be gotten out of single widths.

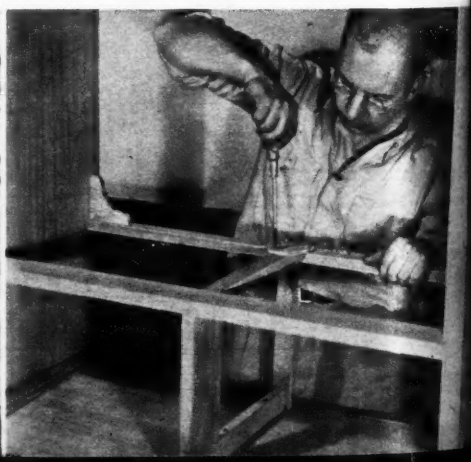
First cut out the two side panels; then cut and shape the two corner posts (Detail A in Fig. 1). The side panels are glued and screwed to these corner posts. Now add two maple cleats to the upper edges. The right-hand cleat has a groove to provide a rail on which the overhead door slides. Cut the top panel to size, lay it atop the side panels, and secure with 2½-in. wood screws driven up through the cleats.

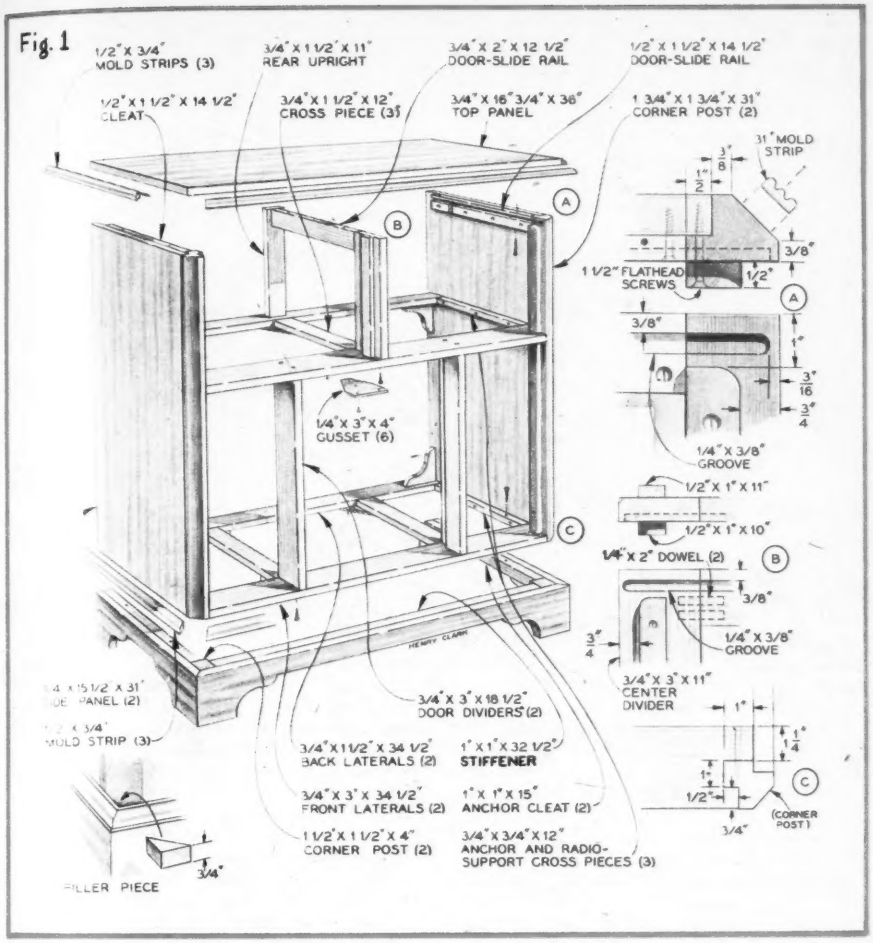
The front laterals, of solid stock, have shaped ends and are fastened as shown in Detail C, Fig. 1. The center divider and door-slide rail fasten together with ¼-in. dowels (Detail B). Next cut out and install the miscellaneous remaining pieces of

Maple channel for overhead door is attached with three or four countersunk flathead wood screws.

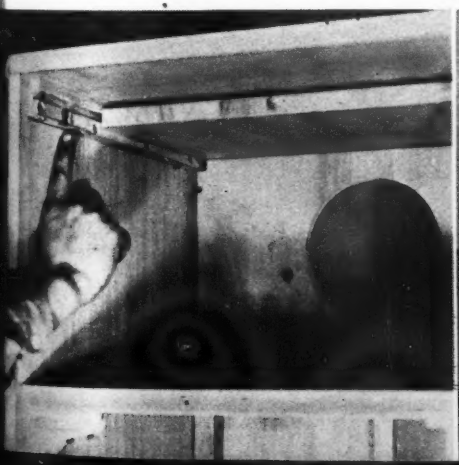


Plywood reinforcements are glued and screwed to the main joints to strengthen the frame properly.

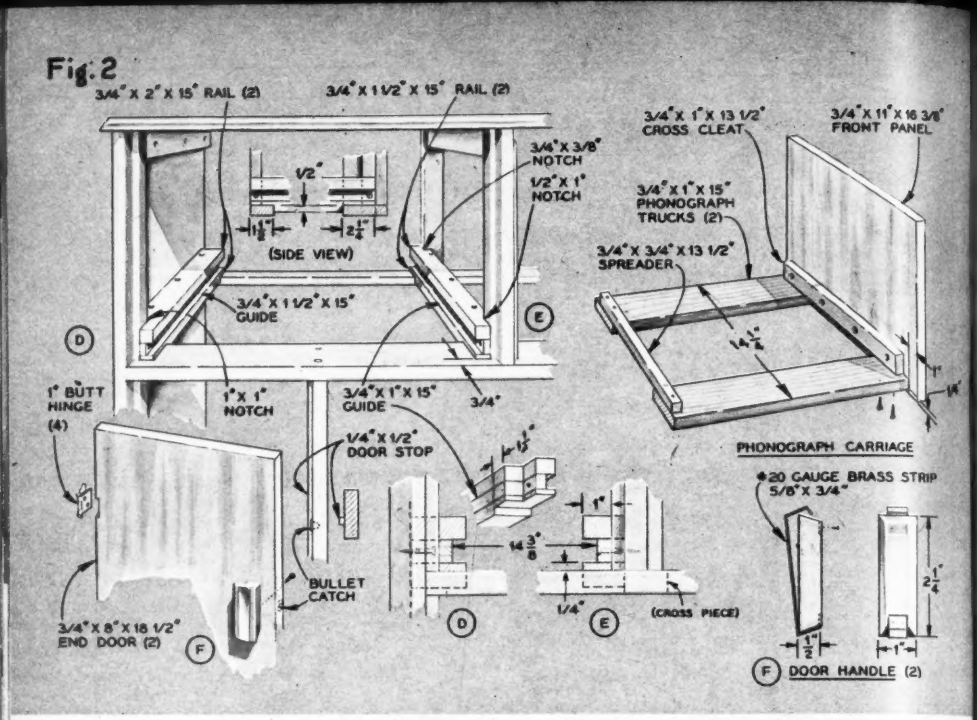




A dado through the toe of the maple channel near back of cabinet permits installing sliding door.



Plane, sand, and wax overhead-door edges until it slides freely in the channels without binding.



framing stock. The lower rear lateral is nailed in from the outside, a molding covering the nailheads later.

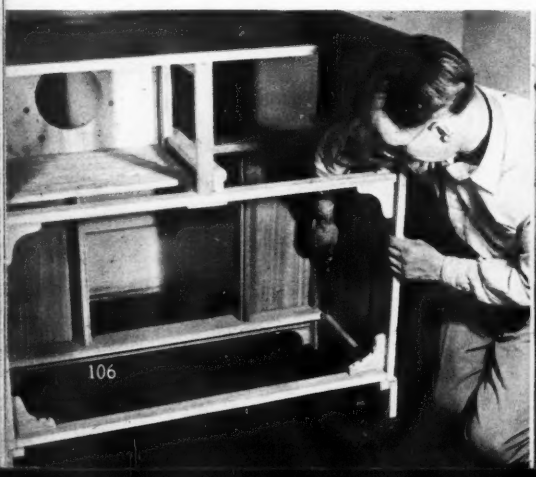
The side rails for the record-player rack are sanded and waxed so the player can slide easily. The radio-compartment door is shown in Fig. 3. Remove about $\frac{1}{32}$ in. from the bottom edge and glue on a piece of matching veneer, since this edge will show when the door is open.

When preparing the radio-control panel, use a paper template from the old cabinet to locate all holes. Carefully glue and nail the record-compartment panels in place to prevent vibration from the speaker.

Details of the speaker baffle and grill are given in Fig. 3. When fastening the trim, use glue and wire brads, setting the heads below the surface and filling the holes with plastic composition wood. Sand and stain; then, when thoroughly dry, brush on wood filler. Allow 24 hours for drying and apply a varnish or lacquer finish, following manufacturer's instructions.

The record player and radio are now installed. To keep dust from the cabinet, attach a fiberboard back, providing ventilation holes in way of the radio set. •

Attach the cabinet to the base with wood screws. Note that base projects ½ in. at sides and front.



Record-player drawer in open position. Provide stops to keep it from being pulled too far out.

Rear view with fiberboard backing removed shows radio and record player in position.

BILL OF MATERIALS

Veneered or Solid Stock

20	sq. ft.,	3/4" thick
1	pc.,	1 1/8"x10"x18 3/8"

Fir Plywood

4	sq. ft.,	1/2" thick
10	sq. ft.,	1/4" thick

Hardwood

8	board ft.,	3/4" thick
5 1/2	lineal ft.,	3 1/16"x3/4"
3 1/2	lineal ft.,	1/4"x1 1/4"
10	lineal ft.,	1/2"x1 1/4"
2 1/2	lineal ft.,	1/2"x1"
2	lineal ft.,	1/2"x1 1/2"
7	lineal ft.,	1"x1"
1	lineal ft.,	1 1/2"x1 1/2"
5 1/2	lineal ft.,	1 3/4"x1 3/4"
21 1/2	lineal ft.,	1/2"x3/4" molding
1	lineal ft.,	1/4" dowel stock
1	lineal ft.,	3/8" dowel stock

Hardware

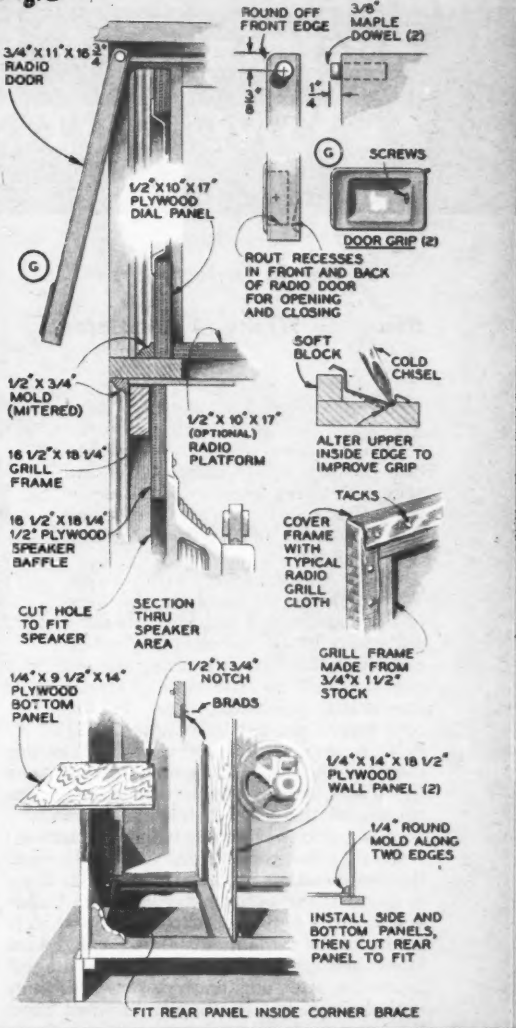
2	brass or bronze recessed door handles
2	brass strips, 20 ga. x5/8"x3 3/4"
4	butt hinges, 1"
2	bullet catches

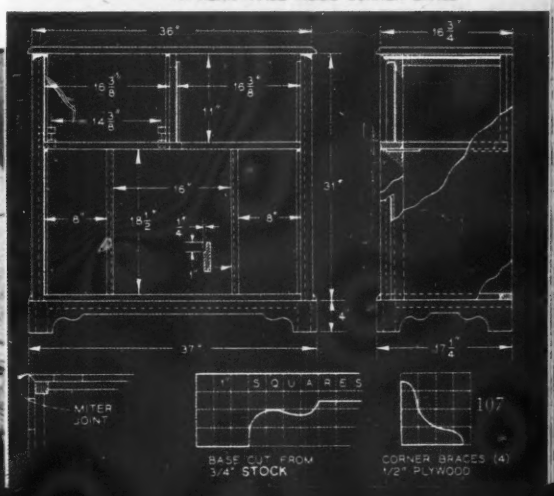
Miscellaneous

Wood screws, finishing nails, brads, glue, stain, filler, and varnish or lacquer

Apply glue to the corner trim strips; then secure them with brads driven in the grooves.

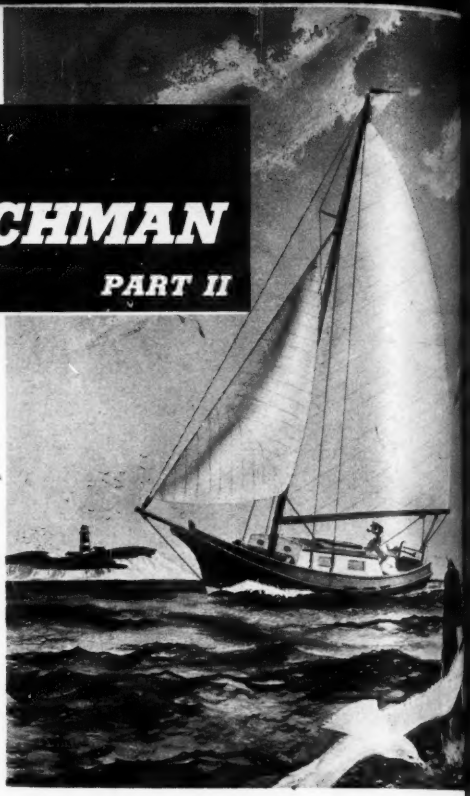
Fig.3





building FLYING DUTCHMAN

PART II



By Gerald Taylor White

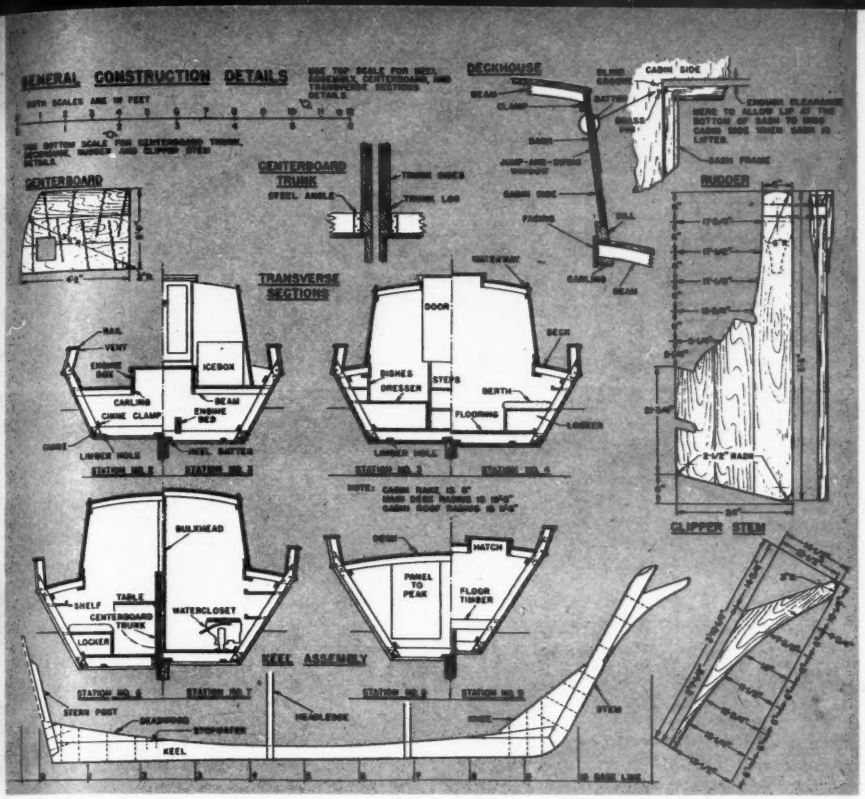
Design by Westlawn Associates

AS mentioned last month, *Flying Dutchman* is patterned after the traditional, time-tested Dutch yachts. She has amazingly comfortable and roomy cruising accommodations for two. This month we are presenting the remainder of the drawings and specifications.

Cabin Construction, continued. While marine plywood can be used for the cabin sides, considerable difficulty would be encountered when rabbeting for the windows; so you are advised to use the material previously specified. The 1x2-in. roof beams are cut to a radius of 11 ft. 6 in. and are located as shown in the plans. One of these beams notches into the upper end of the forward headledge. In way of the cabin hatch, the beams are framed up in the manner usual for hatches. Note that the cabin sides extend beyond the bulkhead on Station 3. The cabin door is made of the same material as the bulkhead and is framed up to suit. The hatch is also of the same material, is arranged on low coamings, and is of the double-hinged type—the after portion folds forward; then both halves can be flipped forward onto the cabin roof. All necessary hooks, hinges, and locks are to be provided. The hinges for the hatch and for the engine box must be of the continuous type. The cabin roof is ¾-in. T&G white pine or spruce, with a V-bead on the underside. This roof is covered with 8-oz. canvas that is laid in glue and turned down under the cabin-side moldings. The roof beams are supported by 1x2-in. cabin clamps, which are shoved up tightly under the ends of the beams and screw-fastened to the cabin sides.

Planking. White cedar, white pine, longleaf yellow pine, cypress, or mahogany, to finish ⅞-in. thick. The number of planks used are shown in the section drawings, but it may be necessary to insert stealers at the forward end. These stealers should not run to a feather edge, but should be nibbed into the planks. Where butts are necessary, they are to be backed with ⅞-in. oak blocks reaching from frame to frame. Each block is to be at least 1½ in. wider than the plank. Butts in adjoining planks are to be at least 3 ft. apart. The planking is secured to the frames with 3-in. boat nails driven at slight angles 4 in. apart. At the stem, stern, chines, and keel battens, use 2-in. No. 12 screws. Bevel the planking so there are $\frac{1}{16}$-in. caulking openings on the outside and the seams are light-tight on the inside.

Decking. All decking is similar in specifications to the planking, but is covered with 10-oz. canvas that is turned up inside the sill and the bulwark ceiling. At the frameheads, the decking extends as close to the frames as possible, watertight joints being made with the bulwark planking, which is ¾ in. thick and extends to a point 1 in. below the rail cap. This must fit very tightly against the deck and must be well fastened to the frames. To further insure watertightness, a shaped quarter-round molding is screw-fastened at the junction of deck and bulwark. All decking is fast-



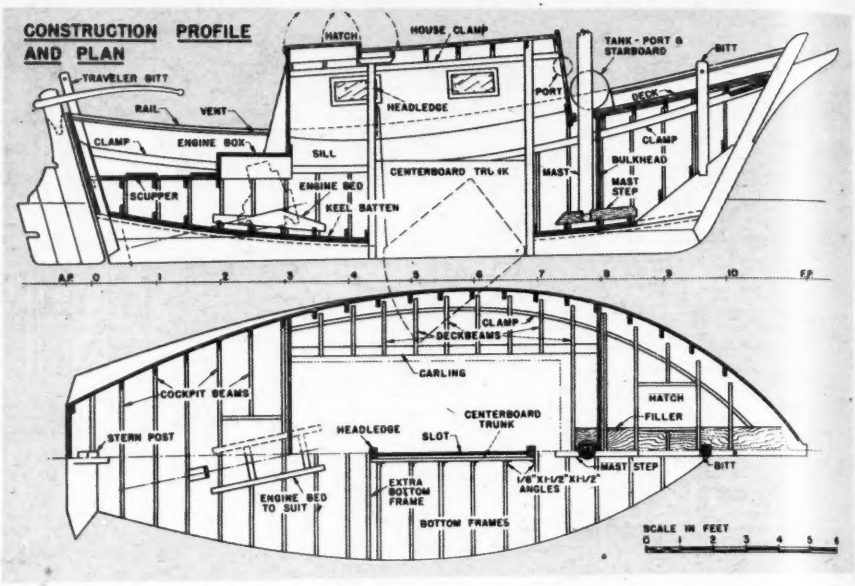
ened with 2½-in. boat nails. The cockpit deck is the same as the main deck. Between Frames ½ and 1, 1½ and 2, and 2½ and 3, the deking extends through to the planking. Great care should be taken here to insure watertightness. Scuppers are then cut through the planking so any water can drain overboard.

Waterways. Around the upper outer edge of the cabin are 1x1½-in. combined waterways and grab rails, which are screw-fastened through the canvas into the cabin top. Cut scuppers through these waterways at the low spots to provide drainage.

Centerboard. White oak, 1¼ in. thick, and of the shape shown in the detail. All pieces forming the board are fastened together with ⅜-in. galvanized rod. Lead or iron ballast, about 35 lbs., is added to overcome flotation. The board is hung on a ⅞-in. bronze pin that passes entirely through the keel and is fitted with cotter pins and washers on the outside. A bronze bushing is placed in the centerboard over the pin. A light chain is shackled to the after end of the centerboard and runs through a sheave at the top of the after headledge, then down to a light tackle. After the board is installed, a cap is secured across the top of the trunk. It has small moldings along the edges to prevent small articles from rolling off.

Rudder. White oak, 1¼ in. thick, built up the same as the centerboard, and shaped as shown, with three notches cut in the after edge to act as a boarding ladder. It is hung on heavy gudgeons and pintles, or else on heavy bronze screweyes through which a ⅜-in. rod is run. The tiller is made of a piece of white oak or ash, 2½ in. deep, 1¼ in. thick, and approximately 4 ft. 4 in. long. It is shaped as shown in the plans. A ball may be carved on the end if desired. The tiller fastens to the rudder through a slot the full thickness of the rudder blade. On each side of the slot there are oak blocks about 16 in. long and 1¼ in. thick, nicely tapered towards the bottom, through-bolted above and below the tiller slot, and screw-fastened at the bottom. Extreme care should be taken to make a strong job here as there is considerable strain on the tiller.

Moldings. Along the main sheer and the rail line there are 1½-in. half-round oak moldings. These must be very well screwed into the frames and it is important that thick paint or marine glue be applied to



the undersides of the moldings before they are fastened. Additional half and quarter-round moldings are used where required to make a neat finish.

Rail Cap. The entire bulwark from stem to stern is covered with a white oak or longleaf pine 1x5-in. cap. This rests horizontally on top of the frames and screw-fastens into the edges of the planks and into each frame. In way of any fittings attached to the cap, oak filler blocks, fitted tightly between the frames and fastened thereto, are used.

Interior Arrangement. Below decks forward there is a large forepeak. It is reached through a deck hatch and through the panel in the forward bulkhead. A light grating is laid here to keep ropes and sails from getting into the bilge. It is suggested, although not necessary, that a 6-in. deadlight be installed in the hatch. The toilet room is built, as shown, of ¾-in. marine plywood. A marine watercloset is installed with lead-pipe connections for inlet and outlet. Outboard of the watercloset, shelves for linen and other equipment are installed. Around the inside of the toilet room, coat hooks are installed to suit. In the main cabin, both of the berths are built of ¾-in. marine plywood and fitted with lockers underneath. The tops of the cushions are 12 in. above the floor. The depths of the berth boxes depend upon the thickness of the cushions and whether or not box springs are used. Shelves are installed outboard of the berths and a folding table of ¾-in. plywood is fitted against the centerboard trunk. A small locker for guns and rods is installed against the after bulkhead between the companion ladder and the starboard berth. On the port side, a dresser, 11 in. high, is constructed, with lockers under it and dish racks over. The stove rests on this dresser in the position shown and must run athwartships. The sink measures 12x12 in. It drains overboard, the dresser being raised high enough to allow this. The water supply is by means of a ⅜-in. copper tube with gravity flow from the tank forward. The companionway ladder is made of ¾-in. plywood and fitted with hooks so it can be removed to gain access to the engine and the lazarette. It is suggested from the standpoint of safety that the stove be set in a zinc-covered box and that the bulkhead abaft the stove be covered with ¼-in. asbestos and then covered with zinc.

Ventilation. A 3-in. mushroom-type ventilator is installed in the forward deck to keep articles [*Continued on page* 136]

LARGE-SCALE PLANS
will greatly simplify construction. Send $3 to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Connecticut. Please specify Plan No. B-159.

BILL OF MATERIALS

(Approximate Quantities Required)

White Oak

(Specify that wood is to be used for boatbuilding; is to consist of first, second, and select grades only; and is to be air dried to a maximum of 15% moisture content.)
Stern Post, Mast Step, Main Bitt, Bowsprit, and Shaft Log: 20 lineal ft., S4S, 4"x4"
Keel: 4 lineal ft., 4"x5" (rough)
Stem: 8 lineal ft., 4"x6" (rough)
Keel and Deadwood: 24 lineal ft., 4"x8" (rough)
Quarter Bitts: 10 lineal ft., S4S 3"x3"
Stem Knee: 4 lineal ft., 3"x12" (rough)
Headledges: 14 lineal ft., S4S 2½"x3½"
Clipper Stem: 4 lineal ft., 2½"x14½" (rough)
Cabin Sill: 32 lineal ft., S4S 2"x4"
Engine Bed and Centerboard-Trunk Logs: 24 lineal ft., 2"x6" (rough)
Fillers: 8 lineal ft., 2"x12" (rough)
Chines and Chine Clamps: S4S 1¼"x2½", 20 ft. long (4 req.)
Cabin Carlings: S4S 1¼"x3", 10 ft. long (2 req.)
Transom (See Note No. 1): 16 sq. ft., S2S 1¼"
Keel Battens, Centerboard, Rudder, Tiller, Boom Crotch, and Breasthook: 40 sq. ft., S2S 1¼"
Cabin Clamps: S4S 1"x2", 10 ft. long (2 req.)
Rail Cap: 50 lineal ft., S4S 1"x5"
Cabin Beams: 50 lineal ft., 1"x6" (rough)
Centerboard-Trunk Sides: 50 sq. ft., S2S 1"
Cabin Sides, Sash Frame, and Waterways (See Note No. 2): 90 sq. ft., S2S 1"
Frames, Deck and Cockpit Beams, Transom Framing, Cockpit Support Posts, and Butt Blocks: 210 sq. ft., S2S ⅞"
Window Battens (See Note No. 2): 12 lineal ft., S4S ⅞"x2"
Window Molding (See Note No. 2): 8 lineal ft., ½" quarter-round
Cabin Molding (See Note No. 2): 1" half-round, 10 ft. long (2 req.)
Sheer and Rail Moldings: 100 lineal ft., 1½" half-round

White Cedar, White Pine, Longleaf Yellow Pine, Cypress, or Mahogany

(For all above species but mahogany, specify that wood is to be used for boatbuilding, is to consist of A and B grades only, and is to be air dried to a maximum of 15% moisture content. For mahogany, specify that wood is to be used for boatbuilding; is to consist of first, second, and select grades only; and is to be air dried to a maximum of 15% moisture content.)
Cockpit Sheathing and Cabin Facings: 100 sq. ft., S2S ¾"
Planking and Decking: 1,000 sq. ft., S2S ⅞"

Mahogany (See Note No. 2)

(Specify as described above.)
Cabin Sides, Sash Frame, and Waterways: 90 sq. ft., S2S 1"
Window Battens: 12 lineal ft., S4S ⅞"x2"
Window Molding: 8 lineal ft., ½" quarter-round
Cabin Molding: 1" half-round, 10 ft. long (2 req.)

White Pine

(Specify as described above.)
Stopwaters: 15 lineal in., ½" dowel stock
Cabin Top: 60 sq. ft., ¾" T&G with V-bead

Longleaf Yellow Pine

(Specify as described above.)
Clamps: S4S 1¼"x2½", 24 ft. long (2 req.)

Sitka Spruce

(Specify that wood is to be used for spars.)
Mast: 5½" dia. x 37'-0" long
Boom: 2¼"x6½"x18'-0"

Marine-Grade Plywood

Engine Box, Cabin Joiner Work, Cabin Flooring, and Bulkheads: 5 sheets, ¾"x4'-0"x8'-0"
Icebox and Deck Box: 1 sheet ⅞"x4'-0"x8'-0"
Bulkheads: 1 sheet, 1"x4'-0"x8'-0"
Transom (See Note No. 1): 1 sheet, 1"x3'-3"x4'-6"

Fastenings (See Note No. 3)

3 lb. galvanized 2" boat nails (No. R-1310)
18 lb. galvanized 3" boat nails (No. R-1310)
1 gross 1" No. 10 galvanized flathead wood screws (No. R-1308)
3 gross 1½" No. 10 galvanized flathead wood screws (No. R-1308)
4 gross 1¾"No. 9 galvanized flathead wood screws (No. R-1308)
1 gross 1¾" No. 10 galvanized flathead wood screws (No. R-1308)
3 gross 1¾" No. 12 galvanized flathead wood screws (No. R-1308)
5 gross 2" No. 12 galvanized flathead wood screws (No. R-1308)
300 galvanized carriage bolts, ¼" dia. x 2" long (No. R-1305)
100 galvanized carriage bolts, ¼" dia. x 4" long (No. R-1305)
50 galvanized carriage bolts, ¼" dia. x 5" long (No. R-1305)
100 galvanized carriage bolts, ¼" dia. x 10" long (No. R-1305)
50 galvanized carriage bolts, ¼" dia. x 12" long (No. R-1305)
25 galvanized carriage bolts, ⅜" dia. x 5" long (No. R-1305)
25 galvanized carriage bolts, ⅜" dia. x 6" long (No. R-1305)
25 galvanized carriage bolts, ⅜" dia. x 14" long (No. R-1305)
40 ft. round galvanized wrought-iron rod, ¼" dia., for through and drift bolts
60 ft. round galvanized wrought-iron rod, ⅜" dia., for through and drift bolts
600 galvanized hex. nuts, ¼" (No. R-1271)
100 galvanized hex. nuts, ⅜" (No. R-1271)
900 galvanized washers, ¼"
200 galvanized washers, ⅜"

Fittings and Equipment (See Note No. 3)

4 brass screen-door pulls, 4¾" long (for windows) (No. R-1187)
1 doz. brass hooks and eyes, 2½" (No. R-1223)
72" continuous brass hinge, 1½" (No. R-1228)
1 doz. brass hat-and-coat hooks (No. R-1211)
30" round bronze rod, 1" dia., for traveller
9" round bronze rod, 1" dia., for main bitt
6" round bronze rod, ⅞" dia., for centerboard
2" brass pipe, 1" I. P. S., for centerboard-pin bushing
2 galvanized rudder pintles, Size 5 (No. R-615A)
2 galvanized plate gudgeons, Size 5 (No. R-615D)
2 bronze portlights, 6" (No. R-962)
30 ft. sail track, ⅞" (No. R-1042)
1 set bronze gooseneck bands with curved mast plate, 2¼" (No. R-1256)
1 eye band, cast manganese bronze, four-eye, 3½" (Fig. 6350; Wilcox, Crittenden & Co., Inc.; Middletown, Conn.)
1 eye band, cast manganese bronze, four-eye, 3" (Fig. 6350; Wilcox, Crittenden)
6 bronze mast tangs for ¼" wire
4 galvanized chain plates, 12" (No. R-1049)
1 V-strut assembly for ¼" jumper stays
1 bronze bobstay strap (No. R-876)
7 galvanized turnbuckles, eye and shackle, ¼"x4" (No. R-1261)
2 bronze swivel deck leaders, Size 2 (No. R-1027)
2 bronze side pulleys, ⅜" (No. R-1123)
2 steel manila-rope thimbles, ⅜" (No. R-722)
4 bronze screw eye bolts, ⅜" (No. R-1350)
3 bronze screw eye bolts, ¾" (No. R-1350)
2 bronze open-base cleats, 5" (No. R-868)
2 bronze open-base cleats, 6" (No. R-868)
3 bronze open-base cleats, 8" (No. R-868)
1 pr. bronze bow chocks, 6" (No. R-861)
220 ft. flexible plow-steel wire rope, ¼" dia.
150 ft. manila rope, ⅜" dia.
150 ft. manila rope, ½" dia.
175 ft. manila rope, ¾" dia.
75 ft. manila rope, 1" dia.
2 single yacht blocks, front shackle, 4" (No. R-1080)
1 single yacht block, side shackle, with becket, 4" (No. R-1084)
2 single yacht blocks, front shackle, 6" (No. R-1080)
1 double yacht block, front shackle, 6" (No. R-1080)

[*Continued on page 138*]

"Modular" cabinet sections are also available and can be built into numerous radio-phonograph-bookcase combinations. Units illustrated are for the Transvision chassis.

Television Kit Roundup

This could be you. An ambitious builder assembles his Transvision kit on an ordinary bridge table.

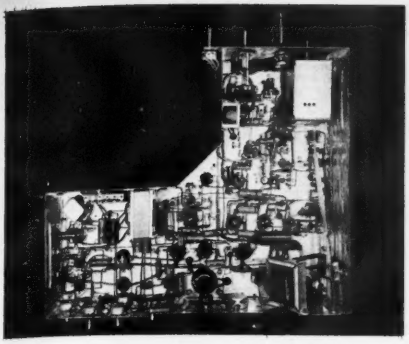
You'll save a lot of money and have a lot of fun building your own television set. Here's the full story on the kits available.

By Robert Hertzberg

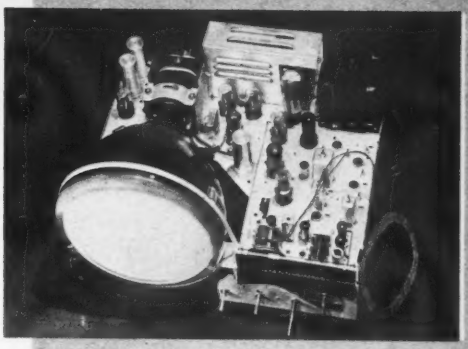
"CAN a man who is handy with tools assemble his own television receiver with any reasonable hope of success? Is it worthwhile; that is, can he save any money on the deal?"

As the television boom sweeps the nation, people everywhere are asking these questions. The answer to both of them is an enthusiastic and unqualified "Yes." According to a survey made by MECHANIX ILLUSTRATED, about 50,000 television receivers in knockdown kit form have been sold since the Fall of 1946, at an average price of about $200. The completed sets are the equivalent (and in some cases exact duplicates) of commercial receivers selling between $350 and $400, so the saving in dollars and cents is a real one. Altogether aside from this angle, putting a set

All sets have hundreds of parts, making necessary complete instruction sheets to simplify construction.



Underside of Transvision set. Look complicated? If you follow the instructions you can't go wrong.



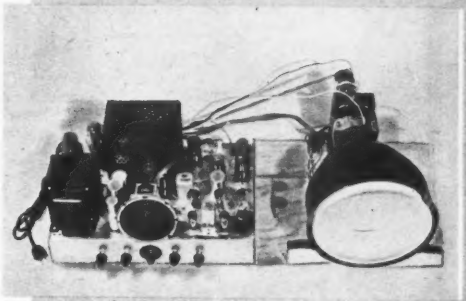
The same set, viewed from the top. The 10-inch tube occupies about one-third the chassis space.

together is a highly interesting and intriguing operation, a marvelous exercise for both brains and hands. The feeling of exhilaration that surges through the successful builder when he turns on his set for the first time and sees television pictures is reward enough for the many hours he put into the job. It's a real thrill, one that will be long remembered.

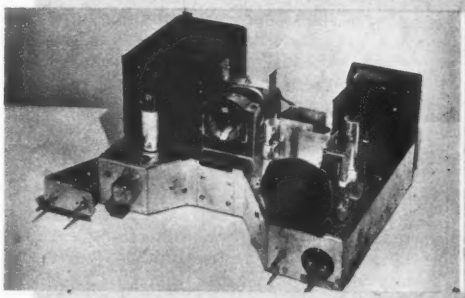
"Is technical knowledge or training necessary?" Helpful, yes; necessary, no. In all its literature, Transvision, Inc., of New Rochelle, N. Y., the biggest television kit producer in the business, stresses the point that it is only necessary to follow directions. The builder doesn't even have to know the names of the hundreds of small parts that make up the set. He opens envelope 9 and connects the item he finds in it to point 6 on socket 25 and to point 4 on part 15, soldering each joint carefully. Every single step is broken down this way, and is supplemented by elaborate illustrations. It is safe to say that any intelligent person who can read English and who knows how to use a pair of pliers, a screw driver and a soldering iron can assemble his own set AND HAVE IT WORK WHEN IT'S FINISHED.

The reader is cautioned not to draw the conclusion from the foregoing that a television receiver is a simple or an easy job. On the contrary, it is a highly complicated piece of equipment using tricky circuits and lots and lots of tubes. Whereas a common broadcast receiver uses five or six tubes, the very smallest "students' type" television set uses eighteen, and the more common ten-inch picture size set uses thirty. It is for this reason that the radio trade was both puzzled and flabbergasted when Transvision, then entirely new and unknown, announced in 1946 that it would market sets in kit form.

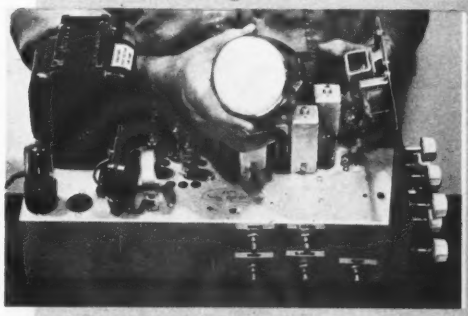
"They're crazy and they'll lose their shirts," was the [*Continued on page* 149]



In the Electro-Technical Industries "Tele-Kit" the picture tube (right) is separate from chassis.



Tech-Master 30-tube receiver. Chassis has odd shape so tube can be mounted in the center.



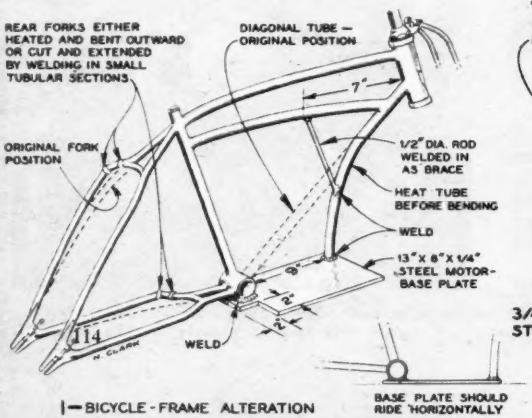
The Espey 3-inch 18-tube receiver must be adjusted and aligned entirely by the builder.

Power Bike

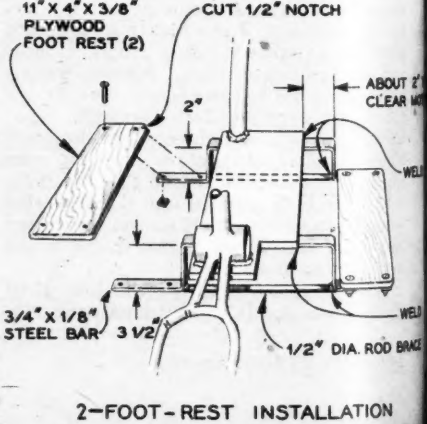
By Earl Seidlinger

GASOLINE-powered engines have been popular with bicycle enthusiasts ever since such engines were made small enough to fit a bicycle frame. The power bike described here is belt-driven. It will go up to 35 m.p.h. on level stretches. It is definitely not a toy that can be hammered or wired together in a few hours, but requires a moderate amount of familiarity with engines and experience in the use of machine tools. For the bike shown, a 1-hp. Briggs & Stratton engine was used—but any air-cooled engine of from 1 to 1½ hp. will do the trick. Start construction by altering the bicycle frame (Fig. 1). The rear forks are cut, bent out, and added to as required to allow clearance for the second rear-wheel rim shown in Fig. 4. This rim is welded directly to the back wheel and acts as a large sheave over which the drive belt runs.

A ¼x6x13-in. steel base plate is notched as shown and welded to the frame. Care must be taken to have the notched side toward the sprocket side of the bike. The notch makes room for the brake pedal.



1—BICYCLE-FRAME ALTERATION



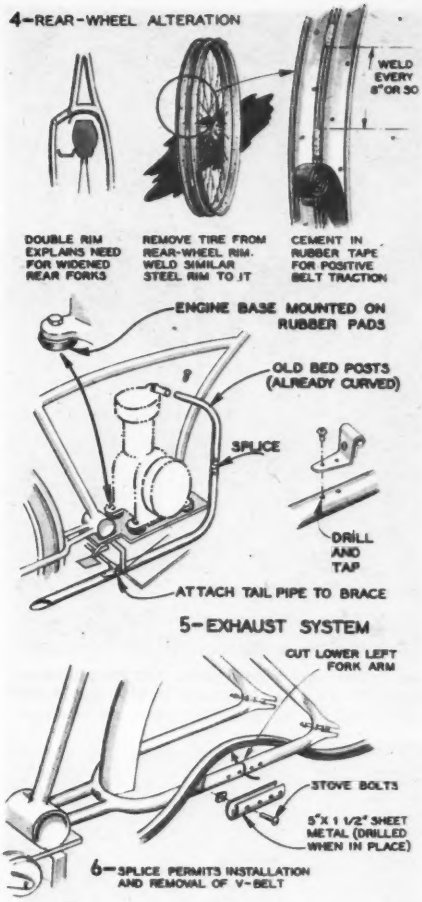
2—FOOT-REST INSTALLATION

Holes are drilled in the base to take the engine hold-down bolts. The exact location of the holes will be determined by the mounting holes in the particular engine you use. Make sure that when the engine is bolted down its drive pulley lines up with the extra rear-wheel rim. The foot rests and their mountings (Fig. 2) are added next.

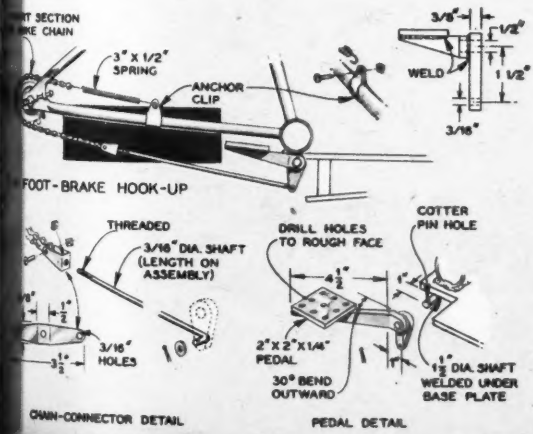
For hooking up the engine, quite a few small parts must be made. The drawings contain all necessary dimensions. Two parts are tricky—the clutch and the brake. The latter utilizes the coaster brake already on the bike. Its assembly is clearly shown in Fig. 3. A short length of chain is cut and run over the rear sprocket. The upper end is fastened to a 3-in. length of door spring, which in turn is anchored to the bike frame. The lower end is secured to a specially made chain connector and thence through a brake rod to a pedal.

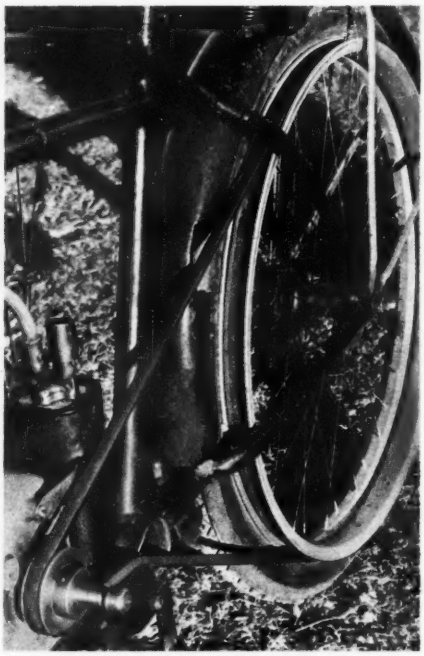
The clutch (Fig. 7), although it may seem complicated, is relatively simple. The clutch-operation diagram explains how it works. When clutch arm, *A*, is pushed down, pivoting at point *E*, it pulls rod, *D*, thus working lever, *B*, and pulling idler pulley, *C*, from drive belt. This operation disengages the clutch. To reengage, slowly let up on the clutch arm. For locking the clutch in disengaged position, a ¼-in. pin protrudes from the clutch arm. This rides in a notch in the spring-loaded locking bar.

Gasoline is fed by means of either one of the handlebar grips (Fig. 8). Ream it out with sandpaper so it will slide and rotate easily over the handlebar, into the end of which a wooden plug and pin are driven. The plug must fit tightly enough so it can't turn. The pin tip fits into the thread of a ¼x4-in. bolt. The inner end of the bolt has a hole drilled through it to take the gas-feed wire, which in turn connects to the



Closeup of engine, below, clearly shows throttle assembly, position of the coil, and how the one-quart gasoline tank is mounted behind the engine.





Here's how the V-type drive belt is installed. Clearly evident are the drive pulley, the clutch pulley, and the extra welded-on rear-wheel rim.

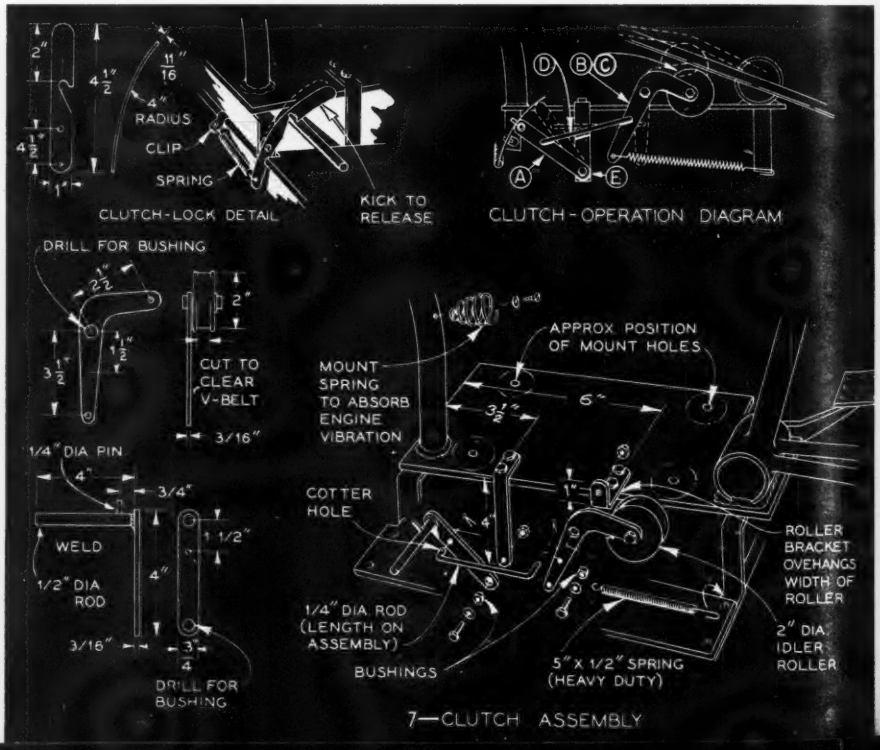
carburetor. A ¼-in. hole is drilled through the handlebar, as shown, to let this wire, which must not interfere with the steering movements, out. To protect the wire, encase it in a length of curtain-hanger spring.

All auxiliary parts of the engine, such as ignition coil or battery, must be mounted wherever there is room. Bicycle frames and engine parts differ; so no set rule can apply. The same holds true for the exhaust pipe. In this particular installation, the exhaust pipe was made from an old iron bed post (Fig. 5). It fell into place without any alteration of curvature being necessary.

The engine should be mounted on vibration-dampening rubber pads, ½ in. thick by 2 in. dia. Further to absorb engine vibration, a coil spring from a bicycle seat is bolted to the front bar in such a position that it rides against the upper part of the crankcase (Fig 7).

Standard equipment on the engine shown was a 3-in. drive sheave. Experimentation proved this to be slightly large. Instead of reducing it, the extra rear-wheel rim was increased proportionately by building up its diameter with rubber tape. This worked well and had the added merit of increasing the friction between belt and wheel rim. As shown in one of the photos, a piece was cut out of the rear fender to allow the belt to pass without scraping.

A continuous V-belt may be pur-

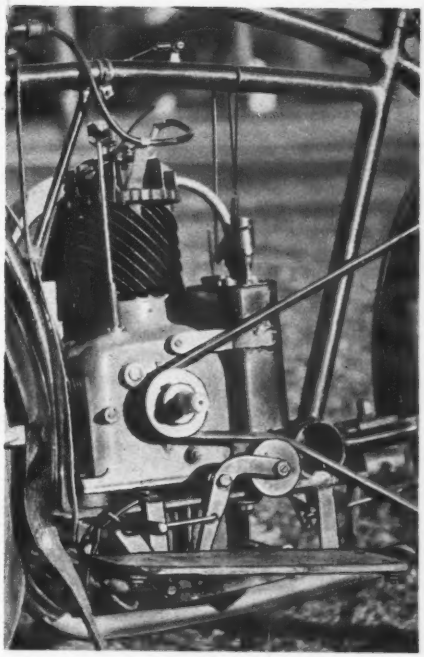


7—CLUTCH ASSEMBLY

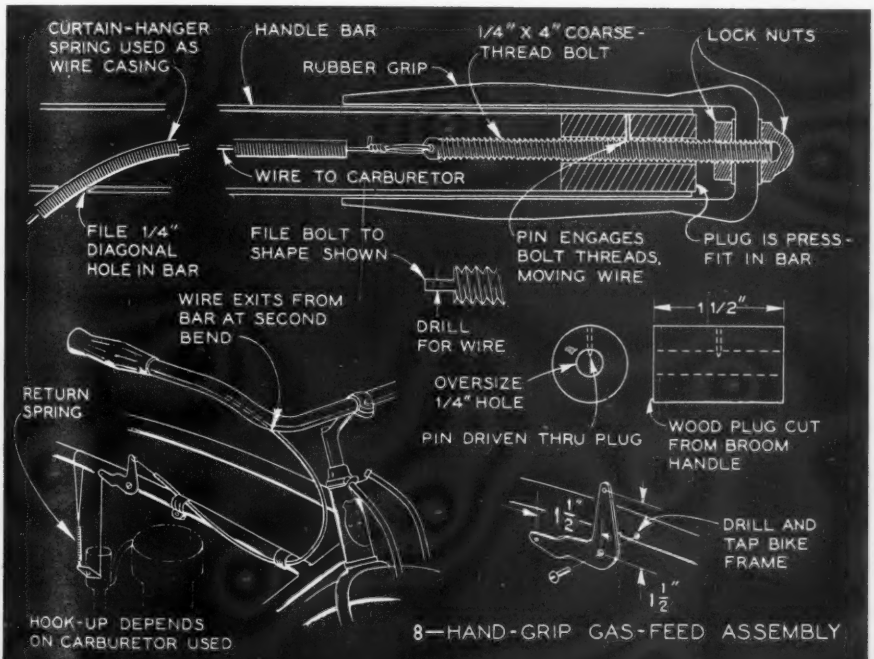
chased at any hardware store, the proper length being determined by means of a string run over the belt track, allowing enough slack for clutch operation. To install the belt, it will be necessary to cut the lower left rear fork, as shown in Fig. 6. A strip of 16-ga. tin, bent to a sleeve and bolted over the cut, as detailed, repairs the break and permits easy removal of the belt at any time. Complete the installation by adding a sheet-metal engine cover so your clothing cannot be damaged.

To adapt this rig to your own particular size and type of bike and make of engine, a certain amount of experimentation will be necessary. For instance, several types of carburetor and sizes of fuel tank were used experimentally on the bike shown. It will be found, however, that drastic alterations to the basic methods described won't be necessary since they are just about as simple and efficient as is humanly possible.

On the subject of engine maintenance, books could be written—in fact, books *have been* written. They're called operation-and-maintenance manuals and the proper one for your engine may be obtained by writing to the manufacturer. Two general notes of caution apply to all air-cooled engines—*always* maintain the proper oil level in the crankcase and *never* fill the gasoline tank while the engine is running. •



Lefthand view of engine showing clutch assembly. Here the clutch is engaged. To disengage, step on foot bar, thus pulling idler away from V-belt.



8—HAND-GRIP GAS-FEED ASSEMBLY

Hand-Hammered POST LANTERN

Beautify your lawn and pathway with this durable, distinctive, quite inexpensive copper lamp.

By Marylou and Peter Gerlach

THE lawns and walks of the old quarters of New Orleans, St. Augustine, and Williamsburg are softly flooded at night with the bright but mellow light of post lanterns. You can emulate the home-owners in these gracious cities, with the expenditure of but a few dollars and several hours of pleasant work, by making this copper lamp.

All of the pieces are cut from a sheet of 1/16-in. copper, 22x33 in., after pasting paper patterns for the various parts on the sheet. Using paper patterns is good insurance, for you cut along the outlines of the paper, thus doing away with any chance of defacing the surface of the copper, as you might accidentally do if you were to lay the work out directly on the metal. Fig. 1 gives all necessary information for preparing the patterns.

After the pieces are cut, soak off the patterns; then peen all of the parts, resting them on a block of iron and hammering the surfaces with a small ball-peen hammer.

The first step in assembling is to bend the socket and chimney holder to shape. The socket is 1½ in. in diameter and the base of the chimney is 3½ in. in diameter. Prior to assembly, the serrations are bent over at right angles to facilitate soldering them in place. The scalloped edge of the chimney holder is optional, but adds a distinctive touch.

Next, form the piece that's used for the post collar. The four ½-in. tabs to which the lamp bottom will later be soldered are bent first. Then shape the collar to fit around the post that you're going to use, checking carefully to assure a snug fit. The post in the photos is 3¾ in. square, consequently the collar was made 16 in. long to allow for overlap needed when soldering.

Following this, solder the lamp bottom to the collar, turning the bottom face down and centering the collar on top of it. If you heat the copper before soldering, you'll be sure that the solder will flow thoroughly between the two pieces of metal.

Now, bend up the four sides of the lamp bottom and solder the holders for the socket and chimney in place, again care-

Prepare full-size paper patterns, using Fig. 1 as a guide, and glue them to your sheet of copper.

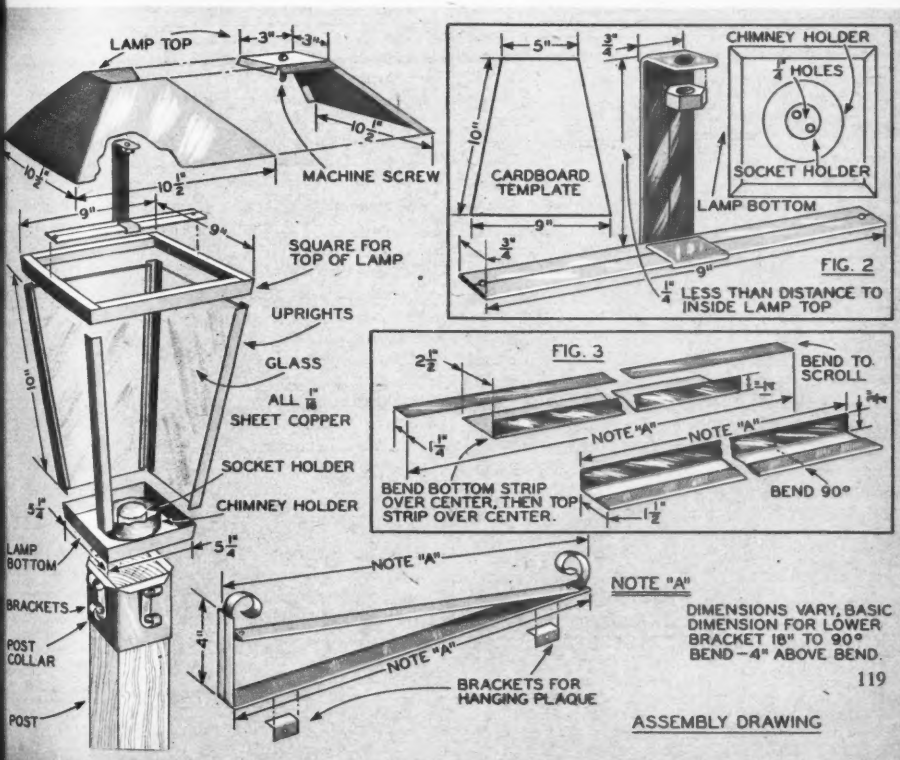
Give the copper top its hand-hammered finish by tapping it over and over with a ball-peen hammer.

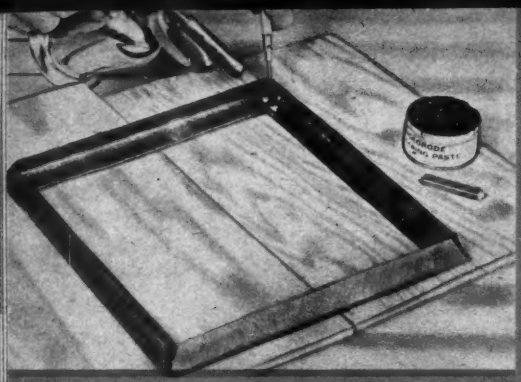
fully flowing the solder between the pieces. At this point, it is well to drill the two ¼-in. holes for the socket leads in the lamp bottom.

Proceed by bending and assembling the pieces that form the square at the top of the lamp. The four ½x9-in. strips are bent so their inside angles are approximately 60° and ⅛-in. holes are drilled at each corner where the pieces overlap; then square them up, fasten together with 6-32 machine screws and nuts, and finish by soldering.

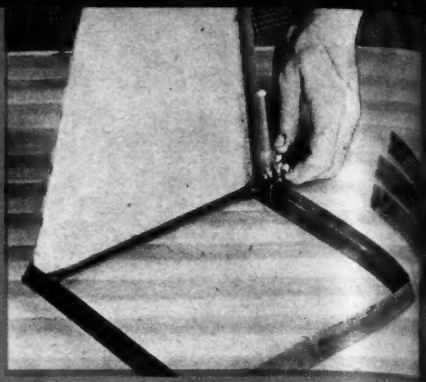
The next step is to solder the four 10-in. right-angle uprights in place at the four corners of the square. A cardboard template cut to the dimensions shown in Fig. 2 aids in properly placing the uprights prior to soldering. After all four uprights are soldered in place, their other ends are soldered to the lamp bottom, holding them in place with small C-clamps and blocks of hardwood to assure proper alignment while they are being soldered.

Begin construction of the top of the lamp by bending the pieces, using a simple brake made from two bolted-together lengths of 1x1-in. oak. Solder the pieces together, flowing solder as previously described and being careful not to get the metal hot

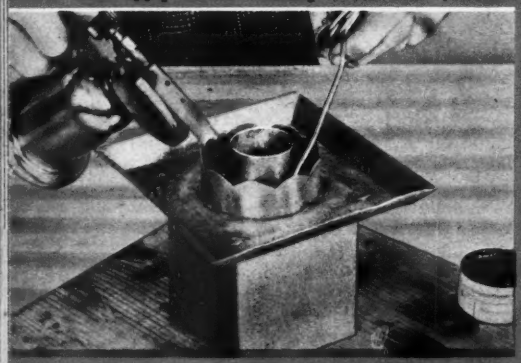




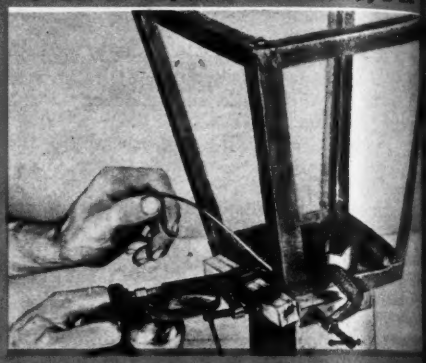
Bolt the square top-of-lamp framework together; then apply solder liberally to all four joints.



When positioning and squaring the side uprights, a cardboard template is the handiest jig to use.



Solder is again used when securing the serrated chimney holder in position on the lamp bottom.



Use small C-clamps and scrap blocks of wood to hold uprights in proper alignment when soldering.

enough to separate the previously soldered sections.

Next, solder the four decorative brackets in place at the base of the lamp. The T-shaped piece shown in Fig. 2 is also installed at this point, using 6-32 brass machine screws to hold the ends of the T to the angle bar at the top of the lamp frame. The lamp top is drilled for a ¼-20 brass machine screw directly over the brass nut soldered to the top of the T-frame.

Cut four pieces of glass ¼-in. smaller all around than the inside dimensions of the frame, slide them through the top of the frame, and secure in place with putty. After the glass sides are installed, put a waterproof pig-tail socket in the holder, running the leads through the two ¼-in. holes previously drilled in the lamp bottom.

The chimney is frosted to resemble that of an old oil-burning lamp by first flowing spar varnish over the inside of the chimney; then, after the varnish becomes tacky, pouring in a liberal quantity of mica (Christmas snow flakes) and rotating the chimney horizontally until all of the inner surface is covered. Place the chimney on a newspaper upside down until all of the varnish has dried completely; then shake out the loose flakes.

The pieces forming the scroll that holds the name plaque are shown in Fig. 3. The plaque can be made of either Plexiglas or ¼-in. waterproof plywood. The nomenclature can be either cut-out wood letters glued in place or any hand-painted design you wish.

Connect the lamp to your home by means of a lead-sheathed cable or a section of conduit that runs underground to any convenient outlet. Your local hardware dealer usually stocks the type cable used for underground electrical leads. Put a switch in series with the lamp to light it. After a week or so of being exposed to the weather, the hammered copper will take on a deep burnished color, which is by far the most attractive finish for the material. If, however, you prefer the original luster of the bright copper, you can retain it by coating all the exposed parts with two coats of lacquer or spar varnish. •

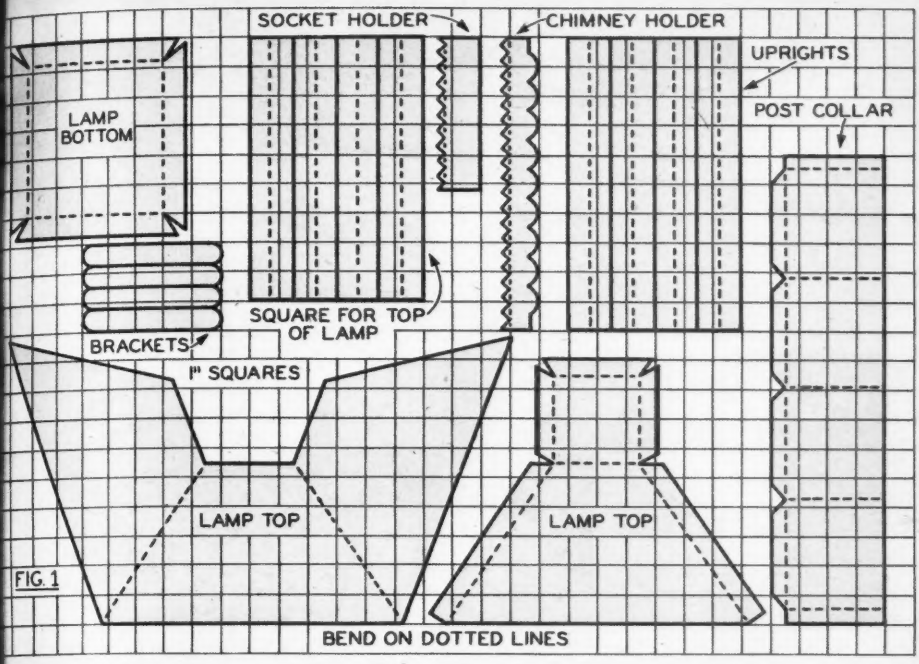
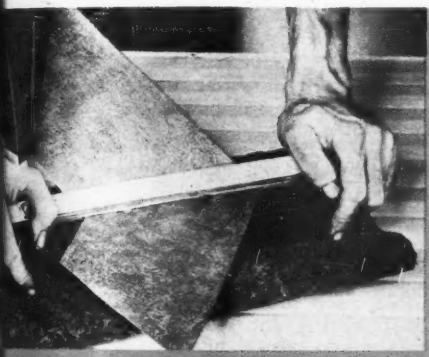
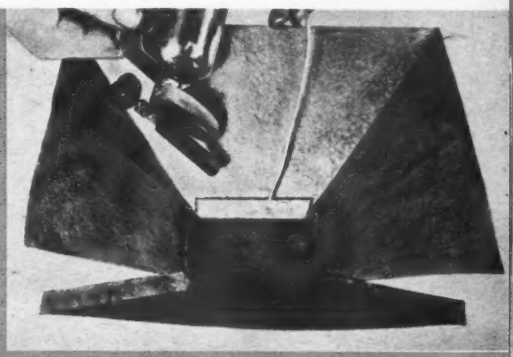


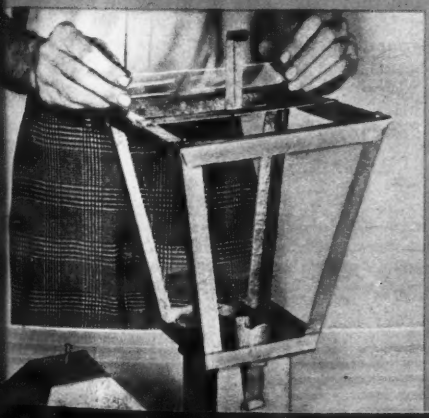
FIG. 1

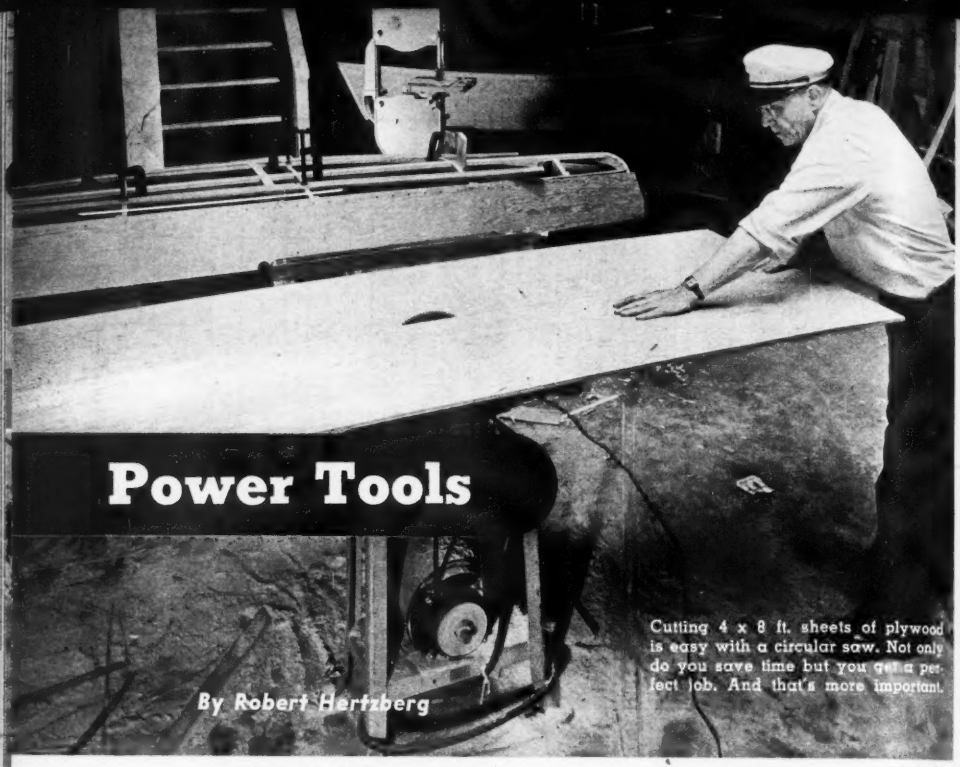




Above: Make a bending brake for forming parts. Below: The glass for the sides are slid into the top of the frame and secured with some putty.

Above: Soldering the pieces of the top together. Below: The chimney is coated inside with varnish; then mica is applied while varnish is still wet.



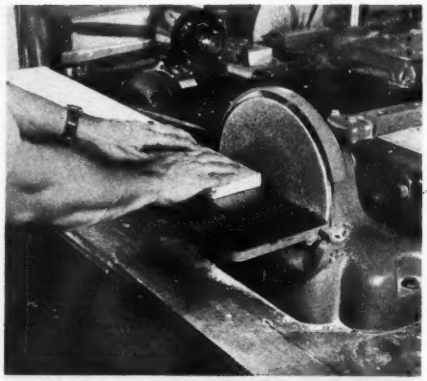


Power Tools

By Robert Hertzberg

Cutting 4 x 8 ft. sheets of plywood is easy with a circular saw. Not only do you save time but you get a perfect job. And that's more important.

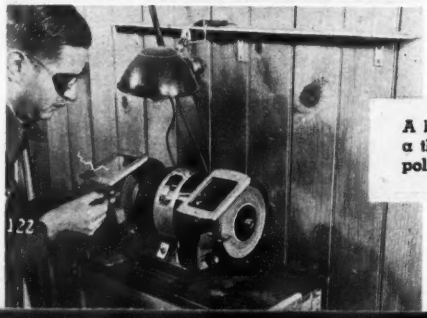
They'll save you money—time—muscles



Sandpapering jobs always consume time and energy—but not if you have a combination belt and disc sander as shown above.

BEFORE the war, power tools in a home workshop were something of a luxury. They were the source of a lot of enjoyment and they made quite an impression on visitors, but economically they had no place on the budget of a family of ordinary means. Power tools are still the source of much enjoyment, but today they fully earn their keep. With their help, a home owner can himself undertake numerous repairs, maintenance and construction projects that would cost a small fortune if done by undependable outside labor at current wage scales. They are a profitable investment on a straight dollars-and-cents basis, and they pay extra dividends in the deep and soul-satisfying feeling that comes from doing an important job with your own hands.

Where does one start? First and undisputed champion among power tools is the circular saw with eight-inch blade and not less than ⅓ horsepower motor. If you can



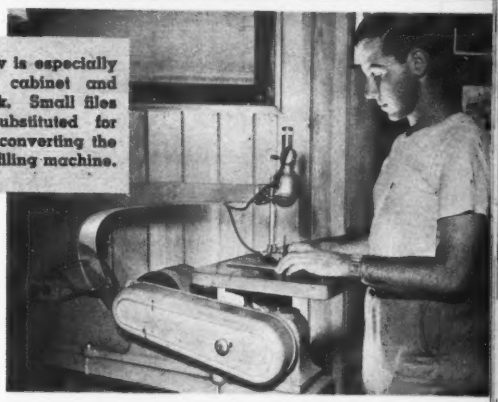
A bench grinder of the type shown at the left will do a thousand and one jobs—from sharpening knives to polishing metalware when fitted with a buffing wheel.

More professional than most power tools, is the metal-cutting lathe. This machine is the gem of power tools: is a life-long investment that'll always maintain its value.

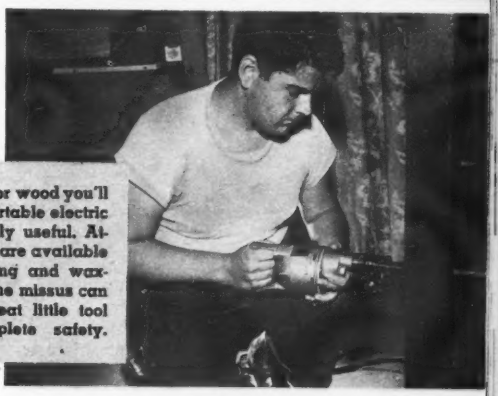
afford only one machine, this is it, positively. With it, you will be able to take all sorts and scraps of lumber and cut them into useful sizes and shapes for an endless variety of purposes. With the left-over little ends you will make block toys for the kids that they'll like better than anything in the local gift shop. You can always cut wood with a hand saw, but wait until you have to rip a ten-foot length of 2 by 4 into two pieces for table legs! The buzz saw does the job in five minutes, and, more important, the pieces come out straight.

I know a young business executive who recently moved into a typical suburban house with his wife and two children. There were no "extras" with the place; he was glad to have a roof over his head. With some misgivings, he bought a good circular saw at the urging of more experienced friends. Within three months the whole home looked different . . . and better. He had made a beautiful picket fence out of scrap pieces of sheathing; several trellises out of resawed firring strip; a set of plain but rugged garden chairs out of broken pieces of studs and joists; a box for garden tools; shelves for the garage, etc. The contractor had left a pile of short ends of flooring, of good hard wood; these became building blocks for the youngsters. A local carpenter had wanted almost $200 for the fence. Since the whole saw cost less than half of that, the tool paid for itself and was producing the equivalent of profit after the first project. And the home owner never fails to say to visitors who admire his handiwork, "I made it myself."

With a dado head on the saw, you can cut perfect grooves for shelving. With an abrasive wheel, you

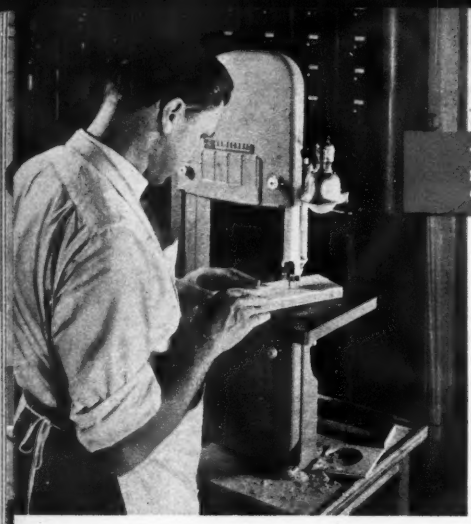


The jig saw is especially useful for cabinet and model work. Small files can be substituted for the blade, converting the tool into a filing machine.



For metal or wood you'll find the portable electric drill equally useful. Attachments are available for polishing and waxing. And the missus can use the neat little tool with complete safety.

For making furniture, screens, etc., the jointer-planer will produce that professional touch. Some manufacturers build this tool into a circular saw frame, use the same motor.



The bandsaw is another specialized tool. If you're planning to build a boat or do any work where large arcs in thick lumber are required, you'll need this tool.

Small high-speed hand drills are most often used for small work such as engraving, routing, polishing, grinding, etc. The tool is very compact and easy to use.

Number 2 power tool in any home workshop is the drill press which can be used for both wood and metal working. Attachments are available for sanding, routing, shaping, etc.

can slice through iron, brass, tile and plastic. No question about it, a circular saw is tops in any home shop.

Next to cutting comes drilling. Hand drills and bit braces have their uses, but for making *straight* holes, for routing, carving and even a bit of surface polishing, a vertical drill press is the thing. If you want to go in for cabinet work, add a dovetailing attachment and you'll soon be in the artisan class.

The combination of a circular saw and a drill press is excellent for a man who doesn't want to spend too much right away. For those who want to expand gradually, there is a choice of many wonderful machines.

A tool of great versatility and popularity is the scroll saw or "jig" saw. With it, designs and patterns of any form can be cut in wood (plywood is the special food for the scroll saw), sheet metal and plastics. It is easily mastered by women and children. It can produce an endless variety of cute knickknacks, toys, table decorations, jewelry pieces, etc.; on my own scroll saw I recently made fourteen window cornices that would have cost three times the original cost of the machine if purchased from a local decorator's shop.

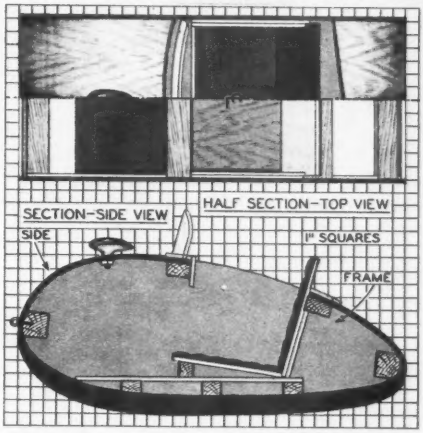
With children in the family, a jig saw will rarely be idle. The smallest scraps of plywood and pressed board become animal silhouettes, or initials for a doll house, or wheels for a miniature cart, or boats for the bathtub. These bits become forever precious when little Helen, age 8, shows them to a friend and proudly states, "My daddy made them 'specially for me." It's a thrill of no slight importance to daddy.

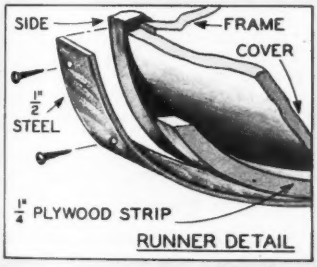
Quite incidentally, the scroll saw will do more serious work too. Fitted with files or sanding sticks, it can save many weary hours of labor. With the proper blade, it makes the cutting of irregular openings in radio chassis a pleasure instead of a chore.

Supplementing the circular and scroll saws are the band saw, the jointer, the shaper, and disc and belt sanders. The band saw is most useful for sawing outside curves in heavy [*Continued on page* 140]

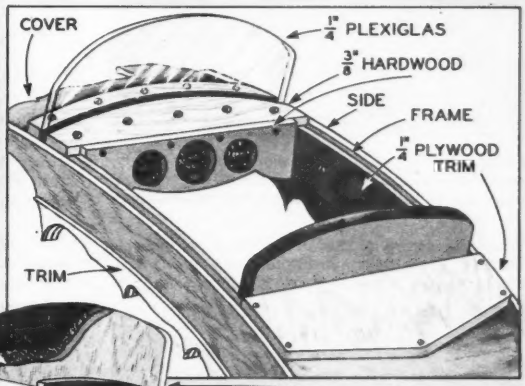
Streamlined Sleigh

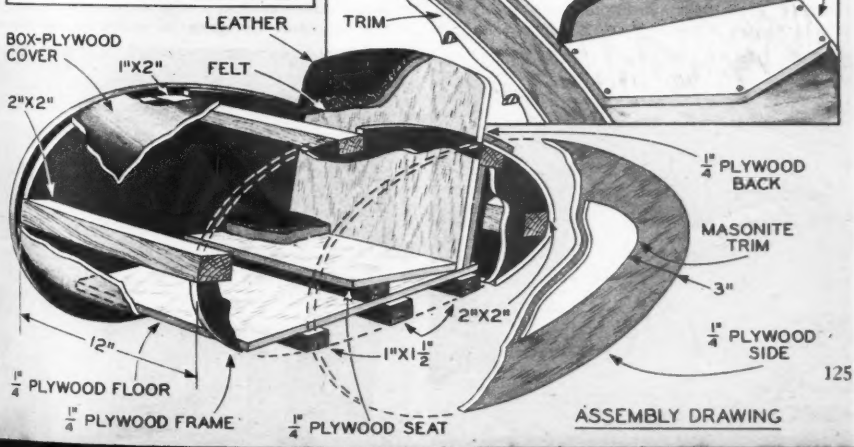
ALL-WEATHER comfort for small children, functional design, ease of construction, low cost, and light weight are the features that make this sleigh so appealing to the craftsman-father. Each side consists of two pieces of 1/4-in. plywood screwed together. The outer pieces are cut to the outline shown in the sectional view and the inner ones are cut to the same general shape but the thickness of the plywood cover smaller at the top and 1-1/2 in. smaller along the bottom edges. The eight 12-in. cross members are secured to the sides with glue and countersunk screws. Ordinary plywood from a packing case (a piece about 12 x 60 in.) is used for the cover. Steam it to make it pliable, fasten it at the seat back with a piece of plywood trim, and bend it around the inner side pieces, fastening it to them and the cross members with glue and small box nails. Make the runners from steel strips 1/2 in. wide. Add the windshield, dashboard, and trim. Finish as desired with several coats of exterior paint.—*Harold W. Helm.*





RUNNER DETAIL





ASSEMBLY DRAWING

car care

Photo by Robert Brigh

Parking lights usually grow dim because of rusty, corroded contacts. Keep the chrome plates tight and check the live connection for cleanliness.

If you are undecided whether the clutch facings have worn down enough to require replacement there's a simple way to reach a conclusion. Just note if you can still adjust the clutch pedal for the usual one inch of free travel before the clutch starts to disengage. If not, then the facings are worn out.

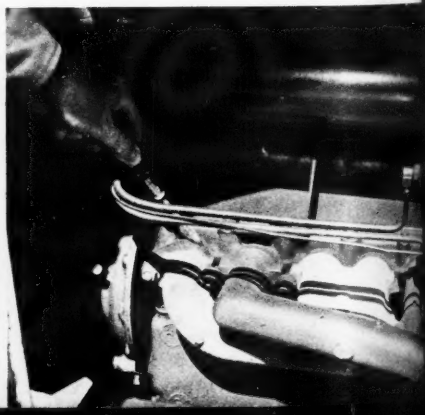
An invisible crack in the distributor rotor will ground it and cause the ignition to fail. To test, just hold the rotor within the spark gap thrown by a test ignition coil. A grounded rotor will let the high tension current pass through instead of blocking it.

Cranking speed is too slow for good cold weather starting if you can count the number of engine revolutions.

Fender skirts discourage too many motorists from installing chains thus causing too many accidents.

This clothes rack is one of the handiest gadgets we have seen. Does not interfere with rear vision or passengers. Made by John E. Coolidge of L. A.

Checking carbon monoxide leakage should begin at exhaust manifold. It is easily discovered by feeding some kerosene to carburetor—outdoors.



BEHIND THE WHEEL

With Fred Russell

If you want a personal reply, please include a self-addressed, stamped envelope.

My 1936 Terraplane has a flat spot at about 20 to 25 mph. When I accelerate at that speed range the car always bucks for a second or two and then straightens out. Stanley Miezin, Cleveland, O.

Replace the acceleration pump in your carburetor.

What's wrong with my 1937 Pontiac? In low gear it will run fine unless I step on the throttle real hard, and then it will die out. John Orloski, Derley, Colo.

Your trouble is caused by a weak fuel pump.

Will a gasoline heater cause excessive carbon deposits in the engine? Will it burn the valves? Sam Thompson, Guthrie, Ky.

Have never heard that such heaters will cause carbon accumulation or burn valves.

The right front spindle on my 1941 Plymouth shows wear where the inner wheel bearing fits. Evidently the bearing is turning on the spindle rather than in the race. Would a complete new bearing help? Virdon W. Taylor, St. Louis, Mo.

Replace the spindle before installing a new bearing.

Shifting into low in my 1939 Pontiac is easy but going into second is very hard. J. Calliger, Chicago.

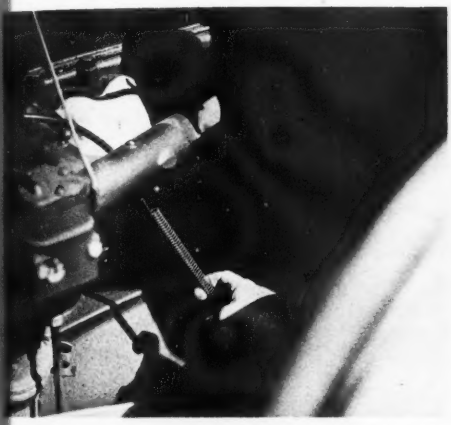
If the difficulty getting into second gear isn't due to binding at one of the bushings of the remote shift control then your shifting may be due to bent or sprung shifter forks in the transmission.

What causes my 1941 Mercury to stall when I stop on a slight upgrade? C. Spaanderman, So. Norwalk, Conn.

Idling speed may be set too low or carburetor float may not have sufficient clearance.

Can I install a 1932 Chevrolet downdraft manifold in a 1931 job? Don Kelley, Oakland, Calif.

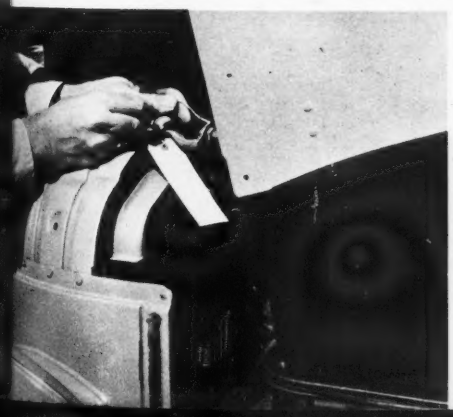
Do not recommend it



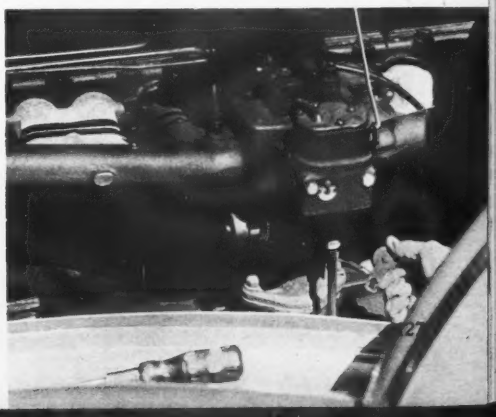
Many automatic transmissions are sensitive to engine idling speed. Check the throttle return spring to make sure that it is operating properly.

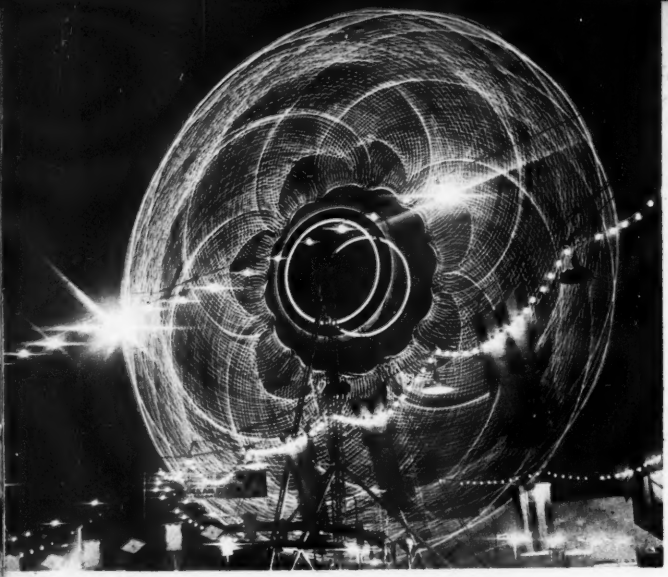
Rubber insulation around the doors will wear better and seal longer if you will half-latch the doors when leaving the car in the garage.

Below: Tag the radiator if your cap has a pressure system. This will warn the gas station attendant not to open the cap when engine is hot.



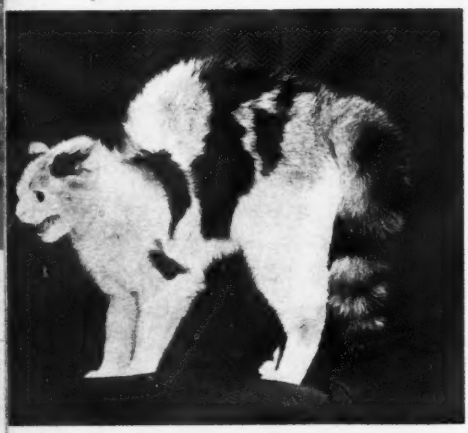
Look over the manifold heat control valve. If rusted in place, the warm-up period will be delayed. Use graphite, not oil for lubrication.





Monthly Photo Contest

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Address: Monthly Photo Contest Editor, MECHANIX ILLUSTRATED, 67 W. 44th Street, New York 18, N. Y.

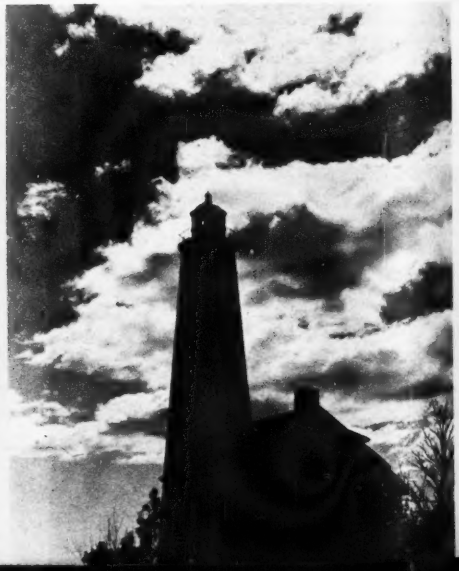


First Prize ($10.00) .....Carnival
M. Wernick of Venice, Cal. takes first prize with a deliberate double exposure of two Ferris wheels.

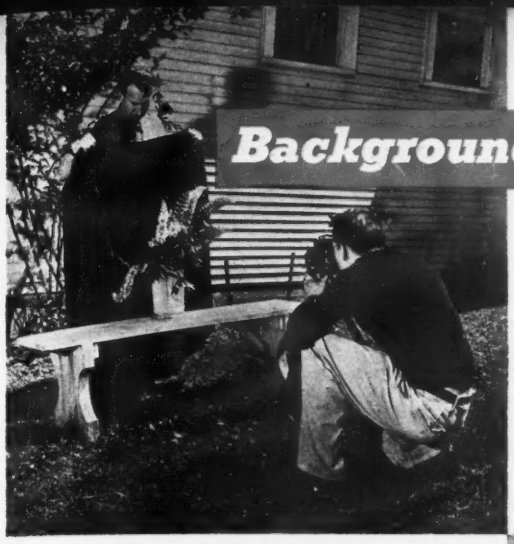
$5.00 Award .....Alley Spitfire
Ralph W. Marks of Chicago snares Puss in a rather uncooperative mood. Super XX and flash.

$5.00 Award .....Charlie
A spotlight was used by Robert H. Rolofson of the Canal Zone to make this view camera study.

$5.00 Award .....Twilight
A Vigilant in the hands of James D. Hawkes, New London, Conn. took this tranquil evening scene.



Backgrounds for Flowers



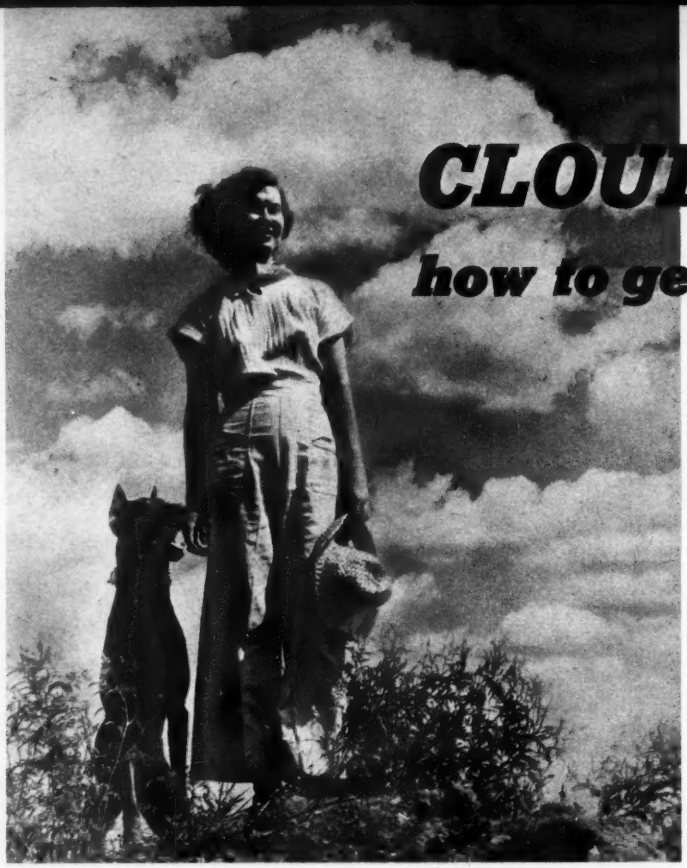
Photographing flowers outdoors, a dark overcoat is used as a background. As shutter is snapped, coat is shaken.

Below: A shutter speed of 1/200th of a second has stopped the movement of the coat. Now compare with photo at left.

A slow shutter speed of 1/25th of a second shows some blurring of the background but the folds of the coat are still too apparent for a black background.

Taking a picture of flowers indoors is much the same technique. In this set-up a photoflood lamp will give much more control of the light falling on the coat.

End result. A smooth, black background achieved by using slow shutter speed (1/5th sec.) with rapid movement of coat.



CLOUDS...
how to get them

A sheet of glass supported over the easel holds several tufts of cotton which project as clouds on the paper.

Compare the photograph above with the barren picture at bottom of next page.

By Kenneth H. Adams

THE addition of clouds in an otherwise cloudless picture falls into two classes. Clouds furnished by nature or clouds added manually by the ingenuity and skill of the worker. Although there are exceptions, nature will prove the better craftsman both for authenticity and naturalness.

It would be false, however, to have the sunlight hit our main subject from the east and our clouds from the west. It doesn't occur in nature, so don't let it on your print. By reversing the cloud negative in our enlarger, it is possible to change our lighting from left to right.

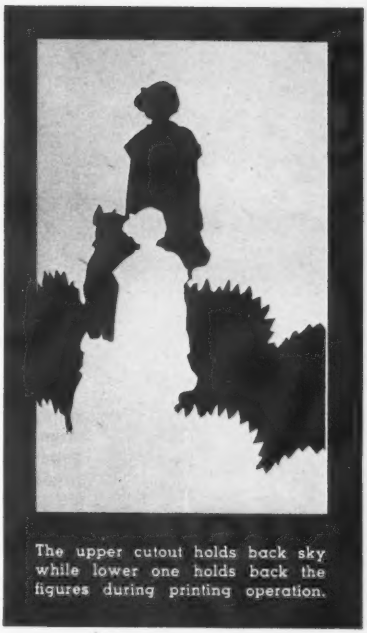
The first step is to place our main subject negative in the enlarger and project it onto a white card. Focus the image sharply and draw a pencil outline. On another piece of cardboard again draw a pencil outline. This time focusing about 2 in. above our printing frame. The second pencil outline is then cut out giving us two masks.

Make test strips on both the foreground and

cloud negatives. We can vary the exposure for each, but development time must be the same. Hold the sky mask about 2 in. above the sensitized paper and expose for the foreground. The mask must be moved during the exposure so as to give blended edges.

With the penciled outline that we did not cut out, we project the cloud negative arranging the clouds in the desired manner. Now we are ready to expose the clouds. With the cutout of the figure, shade that part which has already been exposed. Here again, slight movement of the mask is necessary. Develop this combination and see how you made out. Harsh edges and lack of blending indicate lack of movement of the masks during the exposure.

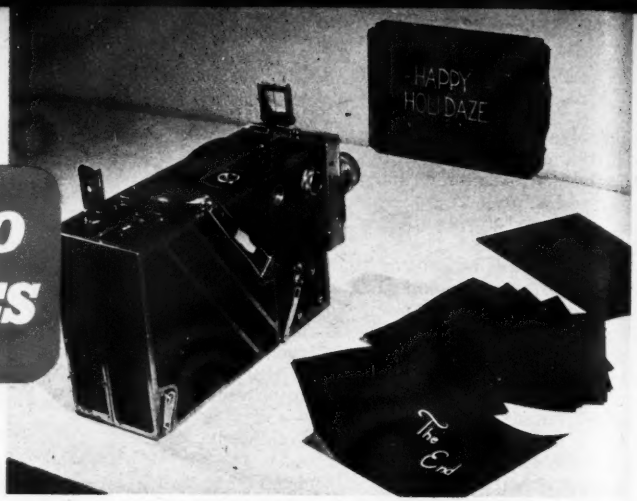
Many unusual and pictorial effects can be easily accomplished in the darkroom by a method that is both easy to do and interesting. This method is the interposing of ordinary absorbent cotton, between the sensitized paper and the enlarger lens during a foreground exposure to produce a cloud effect. By this method, it is possible to place clouds exactly where desired. The shape and size of the clouds are also under our direct control. •



The upper cutout holds back sky while lower one holds back the figures during printing operation.

This cloud negative in combination with the negative of print at the right produced photo shown on opposite page.

PHOTO HANDIES



Movie Titles. Black sheets of paper used to separate cut film are ideal for making movie titles. They accept chalk readily and can be used in cut film holders.

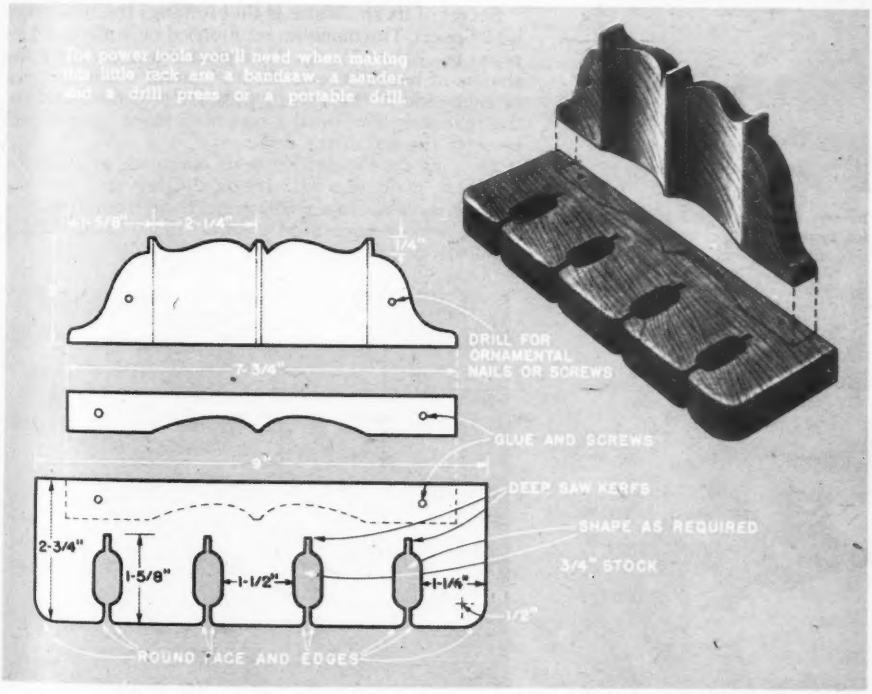
After junior no longer insists upon chocolate flavored milk, the mixer can be used in the darkroom. Mount it in a quart Mason jar and use it to prepare your developing solutions. Note the gradations on outside of jar.

Captions. Blank, gummed, perforated labels used for addressing envelopes are handy for captioning photographs. They tear to exact size.

Finger Saver. Ever have a spotlight drop down and bruise your finger? Prevent this by mounting a rubber washer as shown. This will take up the shock in case the clamps slip.

Colonial Knife Rack

THIS simple rack, which may be adapted to take pipes or similar articles instead of the knives shown, depends entirely on the character of the wood grain and a bit of compound bandsawing for decoration. For material, black walnut with a dull-rubbed natural finish is suggested. Lay out and cut the two pieces. The surface contours in the wall support are bandsawed with the piece standing on edge and smoothed with a drum sander. Assemble the two pieces with glue and screws; then apply the chosen finish, taking care here as the quality of the finish can make or break any project. To hang the rack on the wall, use ornamental fasteners. The support piece can be either above or below the shelf, depending on the height at which the rack is placed.



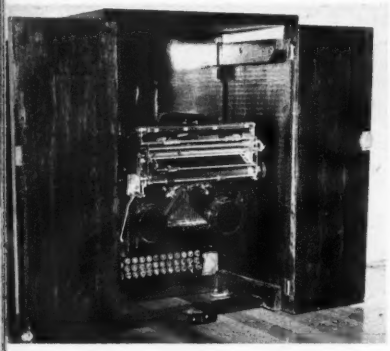
TYPEWRITER DESK for your home

Keeps your typewriter handy and yet out of sight.

By Leo J. Reid, Jr.

When not in use, desk gives no indication of typewriter hidden inside. Matching bookcases are not attached to desk. They are handy for storing reference material.

Below: How typewriter is stored.

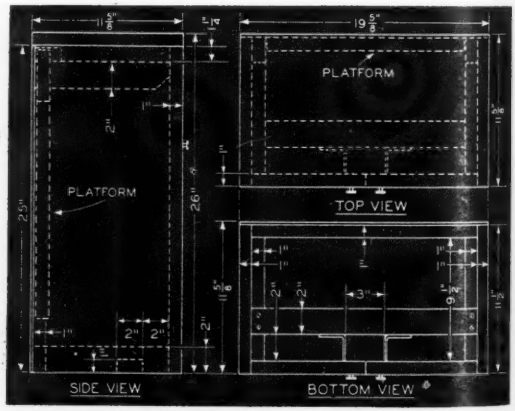


Below: When the desk is opened for typewriter use, the machine will always be at correct height.

ANYONE who likes to use an office style typewriter at home has the problem of where to keep it. This desk gives no hint of its contents or function. In use, it puts the keyboard at the right distance from the floor for comfortable typing. It has no legs under the typewriter platform to bang the knees.

Secret of its small size is that it hangs the typewriter by its heels. The machine is mounted on a piece of 1 in. plywood, 20½x17¼ in. This platform is hung by the shanks of heavy screws through small wooden blocks at each side of the end of the platform farthest from the machine. The blocks rest on waxed runners just beneath the top of the desk.

To bring the typewriter to its operating position, the platform, hanging vertically, is slid forward from the back of the desk to a position near the front. It is then swung into its horizontal position and pushed straight



back so that the center part of the platform, wider than the back, rests on the runners.

Top and sides of the model shown are made of 1 in. Ponderosa pine. The back is ⅛ in. tempered Masonite. The slides, bottom framework and doors may be made of any hardwood.

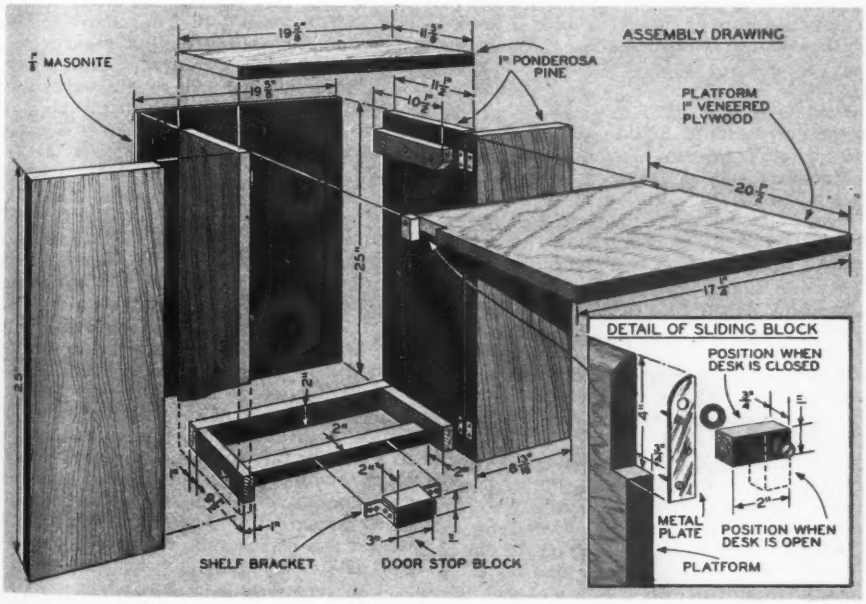
First step is to attach the slides, or platform supports, and the bottom side stiffeners to the sides. Both extend to within an inch of the front, leaving room for the doors. The slides are flush with the back edges of the sides but the stiffeners are an inch short at the back.

The top is attached to the sides with four heavy screws at each side. Maximum resistance to upward thrust is necessary because of the leverage exerted by the typewriter when in use. Countersink the screws and cover with plastic wood.

The rear cross member is screwed to the ends of the stiffeners. The front cross member is fitted flush into the bottoms of the stiffeners 2 in. from the front, and secured with screws. Attach the door stop block to the front face of the front cross member with small shelf brackets at each side. Use roofing nails to attach the back, boring a hole for each to avoid splitting the sides. These large nails will hold the Ma- [*Continued on page* 138]

Above: In order to bring the machine into use, the platform is slid forward to a position near the front and then swung to a horizontal position and pushed back.

Platform has been pulled out to show small wooden blocks on which it is suspended. In use, wide part of platform rests on same pieces on which blocks slide.



Flying Dutchman

[*Continued from page* 110]

in the forepeak from remaining damp. Ventilation to the engine can be provided with two mushroom-type vents or a number of holes in engine box.

Tanks. There are two cylindrical galvanized tanks fitted on the forward deck in heavy oak chocks. Each tank should have at least one swash plate and a filling cap with a small vent in the top. The tanks are held in place with heavy galvanized straps lined with belt lining and drawn down either with turnbuckles or with lag screws. Where the outlet pipes pass through the deck, the openings should be tight. After passing through the deck, the pipes go outboard to the sides of the boat just inside the frames; then down and aft under the cabin floor. A shut-off valve must be arranged under the deck for each tank. The starboard tank is for fuel and the port tank for water.

Deck Box. A deck box of ⅞-in. waterproof plywood is installed alongside the engine hatch. It is used as a seat and as a receptacle for small articles.

Icebox. Similar to the deck box, except that it consists of an inner and an outer box with at least 1 in. of ground-cork or glass-wool insulation between the two boxes. The drain for melted ice runs onto the deck.

Boom Crotch. A scissors-type boom crotch, of 1¼x4-in. white oak, is built as shown in the detail and arranged to hook to the insides of the traveller bitts at cockpit level and to extend far enough above deck to carry the boom when the sails are furled.

Bowsprit. White oak or longleaf pine, 8 ft. long and made from a 4x4-in. piece of material tapered down to 3 in. at the outboard end. It passes through an opening in the bulwark on the starboard side of the stem, to which it is through-bolted. Abaft the stem it is rectangular in section; forward of the stem it is gradually rounded off. It bolts down through the deck fillers and through the bitt.

Mast and Boom. To be of selected spruce and made as per the details. The mast is round in section with a maximum diameter of 5½ in. The boom is rectangular in section, made of a piece of 2¼-in. material. It is left straight on top, slightly rounded on the bottom, and tapered towards the ends as shown.

Deck Fittings. One pair 6-in. bow chocks forward; one 8-in. main-sheet cleat on the traveller aft; two 6-in. jib cleats bolted through blocks on top of the cabin; two swivel-type jib leads, also bolted through blocks on the cabin roof; two 8-in. halliard cleats, one on each side of the mast; two 5-in. lazyjack cleats; two cheek leads for the lazyjack; two thimbles, two eyebolts on the boom, and two eyebolts on the mast for the lazyjack; one boom jaw with band; six mast tangs; one masthead compression band with four eyes; four chain plates; one bobstay plate; one compression band with four eyes for the bowsprit; seven turnbuckles; one V-type strut for the jumper stays; and one mast slide with the necessary fittings.

Standing Rigging. All ¼-in. flexible plow steel, eye-spliced and attached to fittings with shackles or patented attachments. There are four shrouds, a forestay, a jibstay, and two jumper stays.

Running Rigging. Halliards, ½-in.-dia. manila; jib sheets, ⅜-in.-dia. manila; main sheet, ¾-in.-dia. manila; lazyjacks, ⅜-in.-dia. manila. All to be properly spliced and sized.

Block List. All of the blocks are to be of a size to take the running rigging without chance of binding if the rope swells. One single block for the jib halliard; one single block and one single block with becket for the main halliard; two single blocks, one double block with traveller ring, and one eyebolt for the main sheet.

Sails. Eight-oz. sailcloth of a quality to be approved by the owner. The jib is to be fitted with hanks for the stay. The mainsail is to have slide fittings along the mast, lacing eyes along the boom, a headboard at the peak, and two sets of reef points: one 2 ft. above the foot and another 3 ft. 6 in. above the foot. To extend the roach, batten pockets are to be installed at 4-ft. intervals. Both sails are to be supplied with sail covers and strops.

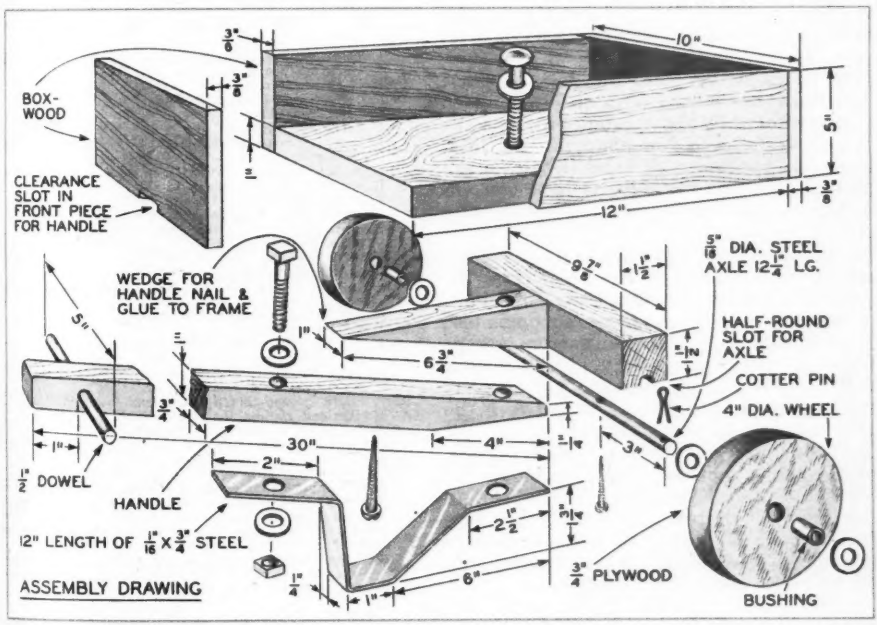
Sail Dimensions. Jib: Luff, 19 ft. 2 in.
Foot, 9 ft. 6 in.
Leech, 15 ft. 10 in.
Mainsail: Hoist, 28 ft. 3 in.
Foot, 17 ft. 7 in.
Leech, 32 ft. exclusive of roach
Roach, 16 in.

Ballast. Like all centerboard boats, this craft will require trimming ballast, the exact amount depending upon the equipment installed. So locate it to bring her to her designed waterline. All of this ballast is inside. In a boat of this character, ordinary building brick provides an excellent ballast. It is cheap and easy to install. The cabin flooring should be arranged with frequent hatches so the ballast can be installed or moved. When the boat is to be hauled out for any length of

[*Continued on page* 138]

Tot's Pushcart

YOUR youngster will like this lightweight, easily constructed, and sturdy pushcart. The pieces making up the body are cut to size and fastened together with shingle nails. Slot the axle block to receive the 5/16-in. axle and screw it to the body. Nail and glue the wedge for the handle to the body. The wheels are either 1-in. stock or 3/4-in. plywood, 4-in. dia., bushed with a piece of steel or copper tubing. Screw the axle to the axle block; then secure the wheels to the axle as shown, inserting the washers and installing the cotter pins in such a manner that the wheels clear the body and there is a slight amount of end play. Secure the dowel to the handle with a finishing nail. The steel bracket is bent so the body will lie level when at rest. Two bolts and a wood screw tie it and the body, wedge, and handle together.



Typewriter Desk

[*Continued from page* 135]

sonite tightly and help it add rigidity to the whole structure.

Close fitting is necessary in making the swinging platform. After making sure that it slides easily on the desk runners, cut out each of the top corners to allow the platform, when vertical, to fit between the slides. These corner cuts should measure ¾ in. wide and 4 in. deep. Now plane the edge of the platform that will stay nearest the desk top as the platform swings—to a quarter-round contour—to prevent the edge from striking the top.

Getting back to the corner cuts, cover the 4 in. face of each cut with a 1x4 in. mending plate rounded at one corner to fit. Then, at a point ½ in. from the top and on the center line, drill through the plate and into the platform to receive the heavy pinion screws. The screw shanks should fit snugly into the holes so that the plates will prevent the weight of the platform and typewriter from splitting the platform.

The sliding blocks, which also should be tested first for fit between the slides and the desk top, are drilled to make a loose fit on the screw shanks just next to the heads. Holes in the blocks are made wider on the outside face to allow the screw heads to sink flush and are positioned just ½ in. from end of the block to permit the platform, when vertical, to go all the way to the rear of the desk. In assembling, put a metal washer on each screw between the block and the platform and tighten the screws until the blocks turn easily but are not loose.

The doors, which clear the desk aperture when open, are locked with an elbow catch on the bottom left and a cabinet lock on the right. If the escutcheon plate for the lock, hinges and knobs are all brass it helps make a neat appearance. Finishing is up to you. Oil stain, shellac and two coats of varnish were used on the original model.

In attaching the typewriter to the platform, position the machine as far down from the pivots as possible without allowing the keyboard guard to strike the front cross member. If your machine is of average, or over-average height, it may be necessary to countersink the hold-down bolts in the bottom of the platform to get the machine to fit between the doors and the rear of the cabinet.

Since the desk is front heavy when in position for use, it must be secured to either the floor or the wall. Easiest way to do this is to fasten two small but heavy shelf brackets to the back at the bottom. And that completes the project. Just wind a piece of paper into your machine and start typing. •

Flying Dutchman

[*Continued from page* 136]

time, it is advisable to remove the ballast.

Painting. All painting to be of a color to suit the owner. There should not be less than three coats of either paint or varnish on the outside of the boat, no less than two coats on the inside. A suggested painting scheme is red antifouling paint for the bottom and the boottop, black from there to the main sheer, dark red between the sheer and the rail, white cabin, white spars, and buff decks.

Anchors and Lines. Depending on whether the boat is to be kept in an exposed location or not, there should be at least two yachtsman's anchors: a 50-lb. one and a 25-lb. one, or the equivalent in patented anchors. There should be not less than 75 feet of 1-in. line for the heavy anchor, the same amount of ¾-in. line for the light anchor, and at least 50 feet of ¾-in. line for warps.

Well, Mates, that's the story. Our last word of warning. If you've carefully read the foregoing, you can readily understand that anyone who builds a small boat must be a jack-of-all-trades. He must do countless jobs of carpentry, attend to the plumbing, install the wiring, fit the engine, cut and splice rigging, and paint and varnish the finished job. All of this requires careful planning, especially if you are an amateur: so don your thinking cap and make haste slowly! •

BILL OF MATERIALS

[*Continued from page* 111]

1	yachtsman's anchor, 25 lb. (No. R-742)
1	yachtsman's anchor, 50 lb. (No. R-742)
1	marine watercloset (No. R-4042)
1	galley sink, 12"x12" (No. R-6015)
1	two-burner stove
2	galvanized tanks, 14" dia. x 30" (No. R-1400)
1	bronze mushroom ventilator, 3" (Fig. 8804; Wilcox, Crittenden)
1	marine engine, Universal 8-hp. Fisherman, or equal
1	engine shaft, 1", length to suit
1	bronze stuffing box, 1" (No. R-575)
1	bronze strut, 1", drop and angle to suit
1	propeller (for Universal Fisherman: 12½" dia. x 7½" pitch, 3-bladed)
55	sq. ft. canvas, 8 oz.
75	sq. ft. canvas, 10 oz.
2	sails from 8-oz. sailcloth, with fittings, as per specifications
2	gal. nonhardening marine glue
2	gal. canvas cement
6	gal. exterior marine paint, color to suit
4	gal. interior marine paint, color to suit
5	lineal ft. ⅛"x1½"x1½" steel angle bar
4	pcs. double-thick window glass, 9"x15"
10½	sq. ft. ground-cork or glass-wool insulation, 1" thick
35	lb. lead or iron for centerboard
	Building brick as needed for ballast

Notes

1. The transom, as mentioned in the specifications, can be made from either 1¼" white oak or 1" marine-grade plywood. Don't order both.
2. For items referring to this note, order either white oak or mahogany. Don't order both.
3. All identifying numbers, unless otherwise noted, refer to the catalog of the E. J. Willis Co., 93 Chambers St., New York 7, New York.

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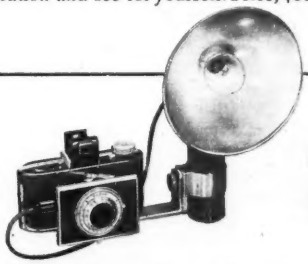
Built-in slide changer takes up to 75 cardboard slides; also takes glass slides. Changer automatically switches on lamp when each slide is inserted, turns it off as slide is withdrawn.

Efficient cooling system (by convection) protects slides in Viewer.

The body is of die-cast aluminum, finished in buff and brown. Viewer uses AC or DC current; has eight-foot cord.



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Power Tools

[*Continued from page* 124]

stock (and light stock too, of course), and from the home hobbyist's standpoint is valuable for furniture and boat construction. For the latter, it is virtually a "must." The jointer is a sort of power operated plane; run a board over its knives and it comes off perfectly smooth. The shaper uses interchangeable rotating blades to produce the curves and fancy edges found on moldings, table edges, etc. The sanders perform an obvious function, and are great labor savers.

A truly terrific unit for people who do a lot of woodworking is a combination of a circular saw and a jointer on a common table, run by the same motor.

The shaper is more a professional than a home shop machine. There is a shaper attachment for the circular saw that can turn out dozens of different molding shapes. It is entirely adequate.

As a home shop enthusiast gathers experience and a few extra bucks, he will want to consider a lathe. In the woodworking models this is relatively inexpensive. Freehand wood turning is something of an art and requires considerable practice, but the end results are very gratifying. There is practically no limit to what can be turned out in the way of table legs, lamps, trays, dishes, decorations, etc., in both wood and plastics. The lathe can be fitted with sanding discs and drums, polishing and buffing wheels, drill chucks, etc. The wood turning lathe is essentially a high-speed machine. Some machining of small metal parts can be done on it, but for this work a back-geared screw-cutting lathe, with much lower spindle speeds, is far superior. Conversely, some wood turning can be done on a metal lathe, but clouds of saw dust get into all the oiled bearings and surfaces and form a mucky mess that is very difficult to remove. Two lathes in a home shop—one wood working and the other metal working—may sound like extreme extravagance, but that's by far the smartest arrangement. A screw cutting lathe is the king of machine tools, and for the hobbyist the ultimate piece of equipment for his basement shop. What can you do on such a machine? It would be easier to tell what you can't do. The numerous accessories available for use on a lathe can readily run to more money than the unit itself.

In discussing power tools in this article, I have not mentioned such motor-operated tools as grinders, polishers and buffers, portable drills, etc. In a way these are basic shop tools and they should be in the house

[*Continued on page* 148]

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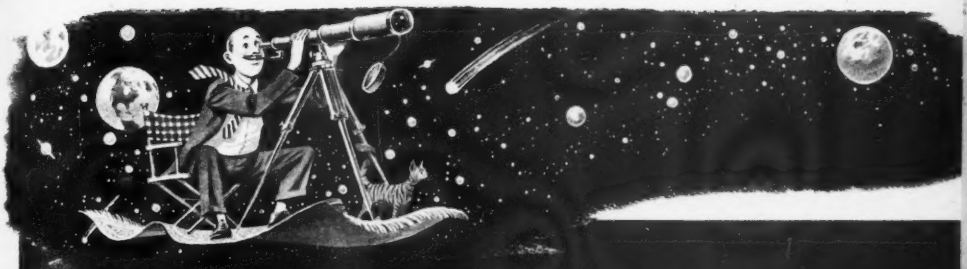


The Amateur Telescope Maker's Page

Conducted by Robert Brightman

ALL of our work, grinding and parabolizing the mirror, making the mounting, and aligning the optical parts, is merely a preliminary to one thing—bringing the rays from a distant object to a point where they can be examined by an eyepiece or ocular.

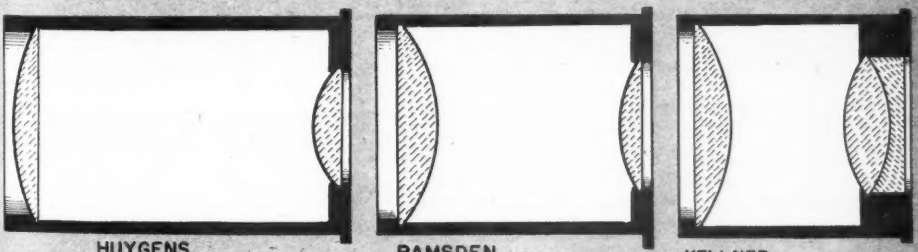
The focal length of the eyepiece used will determine the power of our telescope within certain limits. If you live in a metropolitan area, a 1 in. eyepiece is best for all-around use. This will give you a power of 54x if your telescope mirror has a focal length of 54 in. If you get a ½ in. eyepiece, you will have 108 power. An eyepiece with a focal length of ⅓ in. will give you 162x magnification. In other words, dividing the focal length of the eyepiece into the focal length of the mirror will give you magnification or power. Generally speaking, the resolving power of our mirror is exhausted when a magnification of 50x per inch of diameter is obtained. Theoretically, then, about 300 power would be the maximum magnification which could be obtained with a 6 in. telescope. This, alas, is only obtained under ideal viewing conditions; and, unless you are observing under such conditions, a 1 in. eyepiece will show better details than a high-priced ¼ in. or ⅓ in. eyepiece.

Reams have been writ- [*Continued on page* 144]

Above: Eyepieces from surplus optical instruments make good oculars. Note the adapter to convert it into standard 1¼ in. O.D.

Microscope eyepieces make good oculars. Center, an Orthoscopic; right, Ramsden.

Cross-section view of three of the most popular types of eyepieces. All of these oculars have a standard outside diameter of 1¼ in. Diaphragms are sometimes inserted between lenses.



Telescope Maker's Page

[*Continued from page* 143]

ten about the various merits of different types of eyepieces. Roughly, they can be divided into three categories. The Ramsden, the Huygens and the Kellner.

All eyepieces consist of a rather large field lens at one end and a smaller eye lens at the other. In the Kellner eyepiece, the eye lens is some form of a cemented triplet. The Huygens eyepiece has the flat side of both lenses facing the eye. In the Ramsden type eyepiece the flat side of the field lens faces away from the eye. Generally speaking, the Ramsden ocular is preferred to the Huygenian because the field is less curved. The Kellner eyepiece is really a variation of the Ramsden with an eye lens consisting of an achromatic crown and flint glass combination. This type of eyepiece generally yields a flat, practically color-free field, about 45° in diameter.

Telescope oculars are mounted in standard 1¼ in. outside diameter barrels. The upper photograph on page 143 shows how a war surplus periscope eyepiece has been adapted for use with a telescope. A barrel was machined down to 1¼ in. O.D. and then three equidistant holes were drilled and tapped around the upper circumference to accept three tiny bolts. These bolts engage the barrel of the periscope eyepiece to prevent movement. Final focusing is obtained by inserting the entire combination into an eyepiece adapter.

The lower photograph shows a microscope eyepiece, a Kellner eyepiece and a Ramsden eyepiece, respectively. Microscope eyepieces are not to be despised. They make excellent oculars when fitted with an adapter. They are usually of low power; about 2 in. or 1 in. is common. If the top is stamped 10x it is a 1 in. eyepiece; if it is stamped 20x it is a 2 in. eyepiece. Sometimes the focal length is designated by the Arabic figure 1 or 2.

Aside to readers constructing MI's portable six-inch telescope: when grinding the mirror, it does not matter which way you rotate the disk in your hand as you slowly wend your way around the barrel. You can rotate it clockwise or counter-clockwise, but, whichever way you start, continue. In the initial course grinding stage you can use a relatively long stroke with an overhand of about 2 in. However, when you start in with the finer grades of carbo, the stroke should be shortened to 1 in. fore and aft. In other words, the total stroke equals 2 in. •

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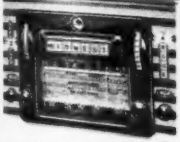

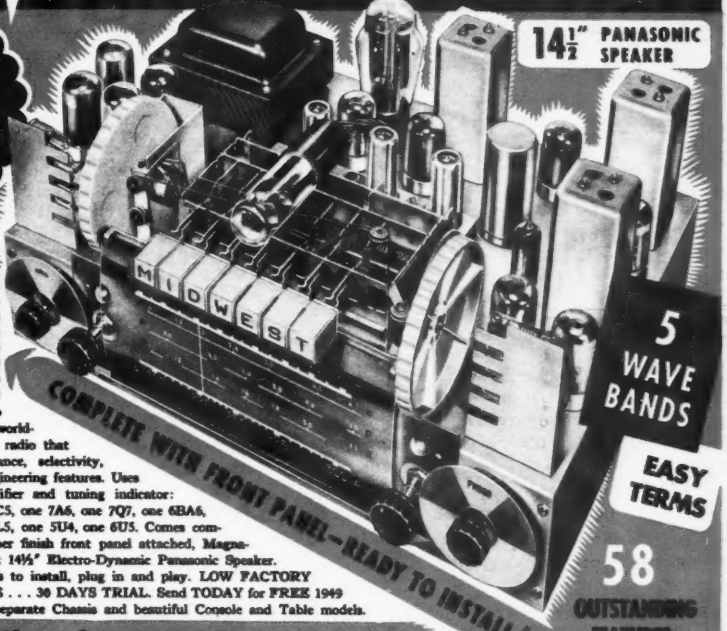

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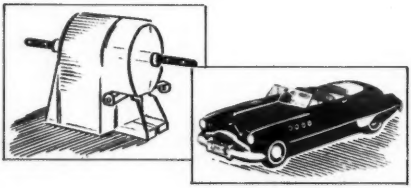

This little power-house (flashlight battery operated) is set in transparent red plastic. Its two-finger size and two ounce weight, its precision and smooth efficiency makes it the perfect power plant for your Buick model. It can be readily hooked up for transmission of power by belt drive, flexible connection direct, universal or friction drive.

SPECIFICATIONS

Height—1½"; Width—1"; Shaft—2"x3/32" diam. r.p.m.—8000 (4 batteries)

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1949 Buick Convertible

[*Continued from page* 103]

The method for making both the twin pulley on the axle and the motor shaft pulley is the same. The core of the latter is a hardwood dowel with the center drilled for a snug fit on the axle. The sides consist of celluloid or aluminum discs ¼ in. larger in diameter than the core. The core of the twin axle pulley is balsa wood of the size indicated, with celluloid or sheet aluminum sides. The axle pulley is drilled for a press fit on the axle and cemented in place. The cement will normally hold the pulley in place but should it break loose, flatten the axle slightly and then re-cement the pulley in place.

Note that the rear axle bearing is merely a piece of brass (or aluminum) notched for the axle, which is held in place by the 1½ in. rubber band "belt." By slipping off the rubber band you can instantly remove the rear wheels.

Before applying the final finish to the exterior, check over your "ignition" system. When wiring, carefully consult the wiring diagram and solder all joints carefully. The two-pole double-throw switch, mounted in the left side of the rear seat floor, controls the direction – front or reverse – while the single-pole single-throw switch is merely used to turn the motor on and off. The battery box is built up from pieces of hard ⅛ in. sheet balsa and is intended for two intermediate flashlight batteries. The terminals are pieces of brass soldered to the ends. If additional speed is desired, you may alter the battery box so it houses four penlite cells, hooked up to produce six volts. This will speed up the motor considerably but should only be necessary if your model is too heavy to run on the three volt battery hook-up shown on the plans.

The steering mechanism for the front wheels is extremely realistic and permits adjusting the wheels so the car will run in circles to the left, right or straight. The king pin clip is cut from brass or aluminum and imbedded into the flood piece, as indicated. The steering arm-king pin is bent from 1/16 in. wire to the shape indicated. The front wheels, which are drilled for a 1/16 in. I.D. brass bushing, slide over the ⅝ in. axle section. Cut away the hub cap portion and cement or glue a small washer to the axle and, to prevent the wheel from coming free. Then recement the hub cap portion back in place. The tie rod, which connects both wheels, is also cut from brass or aluminum and the center is bent so it fits against the tire rod positioner. Thus, by merely altering the position of the lip in [*Continued on page* 155]

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No modern home workshop is completely equipped without MOTO-TOOL . . . the correctly balanced motor-in-hand tool. It grinds, drills, routs, carves, polishes . . . without vibration. Higher speed does work better, faster, on practically any material. MOTO-TOOL Kit No. 2 includes high-speed-steel cutters for longer life, better work. MOTO-TOOL is backed by over 12 years of industrial use . . . packs years of pleasure. Due to wide popularity and increased production, Dremel's pre-war prices still prevail!

MOTO-TOOL No. 2 With Emery Point $16.50

MOTO-TOOL KIT No. 2 With 23 Accessories (High-Speed Steel Cutters, Grinding Wheels, Polishing Accessories) $23.50

DRILL PRESS This 12" high precision drill press is ideal for model making, wood carving, routing, etc. Utilizes No. 2 Moto-Tool. **$9.95 (Less Moto-Tool)**

Approximately 27,000 R.P.M. plus dynamically balanced armature provides vibrationless finger-tip control. Moto-Tool has oilless, sealed bearings. Patented automatic chuck lock pin • Over-size armature shaft—hardened, ground, polished • 110 Volt, AC-DC motor • Sliding snap-type switch • Cord protector • Shockproof bakelite housing • Dust-filtered air-cooling system • Weighs only 13 oz.

MONEY-BACK GUARANTEE: Buy Dremel Moto-Tools from your dealer. If he cannot supply you, order direct on 5-day trial, money-back guarantee. Shipped postpaid for payment in full (Send check or money order), or, send only **$2** now and pay postman balance plus postage upon delivery. Catalog of Dremel Tools and Accessories FREE.

DREMEL MFG. CO., Dept. T149-A, Racine, Wis.

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25¢ a packet of 15 plans

New designs . . . Early American pieces adapted to modern living . . . in 2 series, A and B. Each packet contains 15 sheets, 8½ x 11", with photos and working drawings. Easy to make Christmas gifts . . . cricket, napkin holder, candle stand, etc. Each packet 25c postpaid. Send for both packets. Stanley Tools, 619 Elm St., New Britain, Conn.

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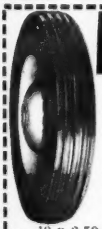

. . . 4" wheel and tire 5/16" steel sleeve	$ .45 ea.
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To order above wheels write number wheels wanted in space provided, tear out and mail this ad with check or money order and your name and address.

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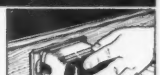
NEW *Electric* SANDER

Only $14.85 POSTPAID

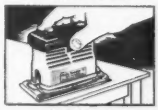
Patented

Amazing MOTO-SANDER and POLISHER

SAVES TIME—SAVES "ELBOW GREASE" Here's a machine that takes the hard work out of two tough jobs . . . sanding and polishing. **"Moto-Sander"** is so easy to handle that a child can use it . . . so foolproof that, with it, even a novice can do a craftsman-like job. **Moto-Sander's** fast, straight-line action (non-rotary) eliminates any possibility of wood burns or scratches. Does a magically smooth job of sanding . . . gets into corners and places others can't reach. All you do is guide it! There are dozens of time and moneysaving uses in every home and shop for this inexpensive machine. Use **Moto-Sander** to get smooth sanded finish on furniture, painted walls, boats, bird houses, scale models, etc. Use it also for speedy, effortless polishing of waxed furniture, automobiles and other surfaces—simply by removing sandpaper and clamping on polishing pad. **Moto-Sander** is the lightest, most practical electric sander on the market—**The only one of its kind.** Furnished with 6 assorted sheets Garnet paper for sanding . . . plus felt pad and sheepskin for wax polishing. Operates on alternating current. Thousands of satisfied users.



EASY FOR AWKWARD PLACES



SANDS FLAT SURFACES EVENLY

GETS INTO TIGHT CORNERS

ROUNDS CORNERS LIKE MAGIC

USE MOTO-SANDER AROUND THE HOUSE

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New IMPROVED *Electric* MOTO-SAW

Only $5.85 (with 3 Saw Blades) Postpaid

Safe As A Hand Saw JUST GUIDE IT!

The versatile **Moto-Saw** is as safe as a handsaw. A touch of the trigger switch sets it going . . . releasing stops it instantly.

Saws to Center of 19" Widths

No Limit to Length of Stock it Will Cut

THOUSANDS OF SATISFIED USERS

AVERAGE CUTTING SPEED ONE FOOT PER MINUTE

Moto-Saw works more like magic than any tool you ever saw! Takes no effort to run . . . no perceptible pressure to feed . . . only a trifle heavier than a hand scroll saw, and better balanced in your hand. Runs 7200 strokes a minute . . . leaves no rough edges . . . easily cuts intricate scroll designs in medium hard wood up to ¾" thick. Blade holder faces blade 4 ways . . . permits sawing sideways as well as forward and backward. Sturdily constructed . . . only two moving parts . . . never needs oiling . . . requires no bench room or floor space. Operates on alternating current. Thousands of satisfied users.

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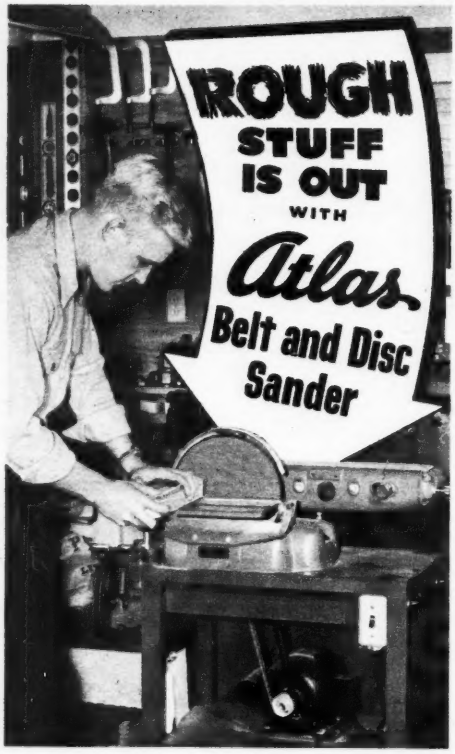
DREMEL MFG. CO., Dept. S149-A, Racine, Wis.



Sands any width boards, angles, curves—metals, plastics

Now you can give every project a true "professional" sanded finish in a matter of seconds—save yourself hours of tiresome hand sanding—with this Atlas Belt and Disc Sander. It is completely adjustable—table tilts 45° both ways, belt can be used in vertical or horizontal position, guards are removable for sanding big boards.

The Atlas gives you a 10" diameter sanding disc, 4" wide belt. It is ruggedly built, with precision ball bearings, to last a lifetime. At dealers or *SEND POSTCARD FOR NEW FREE CATALOG.*

Atlas Press Co.
132 N. Pitcher St., Kalamazoo, Mich.

MATCHED PRECISION TOOLS FOR WOODWORKING AND METALWORKING

Power Tools

[*Continued from page* 140]

before you even consider the larger fixed machines which fall in the "power tool" classification. A lathe won't do you much good, for instance, if you don't have a power grinder on which to sharpen the cutting bits. You can train a youngster on a light motor tool like the "Handee" and then graduate him to the drill press, although he'll continue to use the smaller tool for many purposes.

Likewise, I have skirted around the question of cost. Excellent tools are available at fairly reasonable prices, considering the trend of steel costs. Study the manufacturers' catalogs closely, shop around in the nearest hardware stores, compare features and make selections slowly. These tools are truly lifetime investments, so get the very best you can afford. •

Plan Your Home

[*Continued from page* 98]

stiff paper, label them, and cut them out.

The three-dimensional sketch model is the only method of studying mass and harmony of line—the two factors that make a house either ugly or pleasing to the eye. To construct such a model, lay out each room like an open box, as shown in the detail, again using the scale that you used for the floor plan.

Building the rooms as separate units is desirable because they can be rearranged if and as you desire. The ideal material for a model is three-ply Bristol board, kid finish, which can be purchased at any art-supply store and at most stationery stores. Lacking Bristol board, any cardboard will do. Mucilage is a good adhesive for thin cardboard.

If your house is to have a second floor, proceed with it as with the first floor. In the illustrated model, the second floor, since it was small, was made as one unit instead of being cut up into room-size pieces. Roof measurements are determined as indicated in the drawing.

After constructing your model, study it, and perfect it to the best of your ability; then take it to an architect. He'll straighten you out where lack of technical knowledge on your part might cost you lots of money; he'll offer suggestions for economizing in choice of building materials; he'll prepare a set of working drawings that will conform to your local building code; he'll draw up specifications and contracts; and, finally, he'll see to it that the specifications are closely followed by the builder. Taken all in all, he's well worth his fee. •

Television Kit Roundup

[*Continued from page* 113]

general comment at the time. "Why, there are many experienced radio engineers and service men who are finding it necessary to go back to school to learn what television is all about. What chance does a kitchen mechanic have of getting any place without test equipment?"

The secret lies not only in the excellence of the instructions but in the pre-assembly and alignment operation performed by the manufacturer on certain of the critical elements. The tuning systems (coils and condensers) are furnished assembled, wired AND adjusted, and need only be dropped into position on the chassis and connected to the rest of the set by a few additional wires.

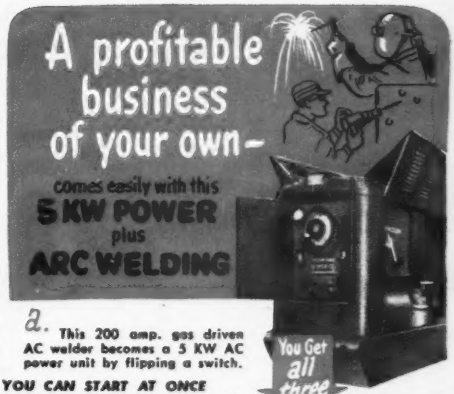
To date Transvision has sold close to 40,000 kits and has expanded from a hole-in-the-wall to a large and busy enterprise. While their customers for the most part are men of the typical American handy-with-tools pattern, they have been surprised themselves by housewives who made sets on kitchen tables (actually!) and by two boys aged 10 and 11 who tackled a twenty-three tube outfit and completed it successfully between homework chores.

Easily the leader of the field, Transvision sells kits for receivers using 7-, 10-, 12- and 15-inch tubes, at prices starting at about $150 for the 18-tube, 7-inch picture tube model. The popular 10-inch tube set costs about $200, the 12-inch size about $250, and the 15-inch about $325. These prices include all tubes and an antenna, but no cabinets, of which a wide choice is available at extra cost. Many builders put the chassis into cabinets, book cases, etc., of their own design, carpentry being a minor accomplishment for people with enough know-how to undertake a television set!

Since even builders of television receivers are human and can make mistakes, there are bound to be some disappointed family groups when sets fail to work the first time they are turned on. What can the builder do? Frankly, he's out of luck until he can get the set looked at by a competent service man who has the expensive test equipment needed for television trouble-shooting. In its early days Transvision had its customers return the sets to the factory. This wasn't too inconvenient because television broadcasting, and hence television set buyers, was limited to a few large cities in the East. Now, it has service stations in all areas served by television stations.

Besides Transvision, there are five other

[*Continued on page* 154]



a. This 200 amp. gas driven AC welder becomes a 5 KW AC power unit by flipping a switch.

YOU CAN START AT ONCE
With one machine, you are ready to start doing business. Lots of highly paid work—repair, construction, maintenance—is waiting for you and arc welding.

OUTSIDE JOBS PAY EXTRA
Ability to operate independent of power lines prompts calls for work in the field. This adds to income from regular jobs people bring to your shop.

A BUSINESS WITH A FUTURE
Your business is sure to grow and you'll want to be able to handle all the big pay jobs. Hobart builds a complete line for all types of arc welding.

BUILD WITH RIGHT FOUNDATION
Make certain of success. Use Hobart. Mail coupon today.

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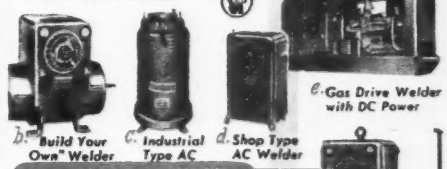
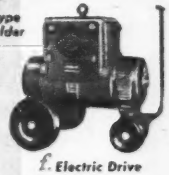


e. Gas Drive Welder with DC Power

b. "Build Your Own" Welder c. Industrial Type AC d. Shop Type AC Welder



f. Electric Drive

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Beautify your car . . . bring out the flowing lines inherently designed there.

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DUAL INTAKE MANIFOLDS for V-8 FORDS AND MERCURYS
$15.00

Gas Line and Throttle Kit $2.50 extra. Chrome Plated Velocity Stacks $3.00 pair.

By test: Increased acceleration by by 26%—increased power and speed by 11%.

All DIXIE WESTERN manifolds are brightly polished cast aluminum.

ATTENTION service station men, garage men, and auto parts store owners; we have a profitable dealer's discount on quantity orders of any of the above merchandise.

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We show you how to build this NEW Powerful welder without rewinding. Uses coils taken from old auto generator. Has 20 heats. Operates on either 110 or 220 volts A. C. Learn to weld. Make money welding for others. Complete plan and valuable catalog 35c.

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"Yum-Yum" Youth Knows What's Cooking

"YUM-YUMS OF WOW" is what the name sounds like. Spelled out correctly, the name is Niam-Niams of Wau. Wau is in the southwestern Sudan, in eastern Africa, and Niam-Niams are a very hospitable tribe. Nobody, though, is particularly anxious to accept the hospitality.

Members of the University of California African Expedition were in one of their towns lately but didn't care to stay there overnight.

The Niam-Niams of Wau, you see, used to be cannibals. They've reformed now (maybe).

The native cook attached to the expedition was given quarters in the Niam-Niam village while the rest of the party set up their tents a short distance away. At nightfall the cook reappeared and flatly refused to stay in that town after dark. He wanted no part of Niam-Niam cooking and still less did he want to *become* part of it.

When the British district commissioner, Basil Duke, was hiring workmen for a job he man who was alone in the village and taking it easy. Asked why he wasn't working, the young Niam-Niam calmly replied,

"Oh, you see, I'm taking some time off. I'm to be eaten next week!" •

New Year Special

3.95
(CAR ONLY)

The Famous **"THIMBLE DROME" RACER . . .** ***Complete with Engine . . . for less than the price of an engine!*** This little beauty has a sturdy die-cast, all-metal body . . . molded rubber tires . . . gear driven rear end . . . We offer you the whole works, complete and ready to run, including a guaranteed, tested gas engine for only $19.95 . . . . HURRY—This offer can't last. C.O.D.'s must have $1 deposit with order.

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Who's Afraid?

[*Continued from page* 90]

gear, the wheels won't turn. Unlike an automobile, you can't start a motorcycle engine with the clutch depressed, the way I've been starting a car for years. So you have to be sure the bike is in neutral or it will move forward when you start it.

Standing on the left side, I turned the ignition switch and kicked the starter pedal with my right foot—an easier way, Walter had said, than to straddle the bike and start it with the left foot. The engine turned over immediately. (A few days later I tried for twenty minutes to get the engine going and finally gave up in disgust. Next morning I gave it one kick and it started right up. Temperament? No, more likely my ignorance of the fact that a motorcycle, like a car, has a choke which you have to use now and then.)

Ours is a quiet street and there was, thank goodness, no traffic in sight when I rolled away from the house on my first solo trip. A few yards down the road I gingerly hoisted my feet up on the foot spuds (rubber-covered knobs which replace the steel footboards my friend's four-cylinder bike had) and rode along very slowly, in low gear, feeling and probably looking like an apprentice jockey walking his first mount to the starting gate. For a fellow with legs as long and as knock-kneed as mine, the position is slightly uncomfortable and on a long trip might be rather tiring. But at the moment I had other things to think about.

For more than an hour I rode along the loneliest roads I could find, shifting up and down through the gear range (third and fourth were so similar, to me, that I had to look down to see which gear I was in) and getting accustomed to the brakes (a hand lever controls the front wheel, a foot pedal the rear—both on the right side). I practiced turns, trying to get the hang of changing direction by shifting my weight instead of "steering" the handlebars. Unless my eyes deceived me, I found I could make wide turns with the front wheel pointing dead straight ahead, just by leaning my body properly.

If I had never ridden a bicycle I suppose I might have had a bit more trouble getting along on a motorcycle. But as it was, I discovered to my astonishment that self-confidence built up very rapidly. My fear of motorcycles diminished to the point where the only remaining vestige was a healthy respect for the fact that, unlike a bicycle, a motorcycle can accelerate from zero to a mile a minute in pretty darn short order. But I learned that a motorcycle itself isn't "danger-

[*Continued on page* 152]

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Homecrafters' Choice

This is it—the famous Tool of 1001 Uses — first tool of this type and today's finest. It's the tool for you whether you're an eager beginner or an expert.

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You'll enjoy making ship, train and plane models, puppets, costume jewelry, wood carvings, bookends. You'll engrave monograms on glassware, tool leather billfolds, handbags, etc. And it's a dandy for all kinds of repairs. Used by industry for exacting production jobs —preferred by craftsmen and mechanics.

EASY TO USE as a pencil. Fits your hand comfortably Lightweight, only 12 oz.

WORKS ON ANY MATERIAL. Metal, alloy, glass, plastics, wood, horn, bone, leather, etc.

PACKED WITH POWER AND SPEED. Runs at a cool 25,000 r.p.m. AC or DC current.

DESIGNED RIGHT in every detail—result of 50 years' experience. Close-fitting motor, non-breakable housing, 7-segment commutator, interchangeable spring collet clutch. Every part triple-tested to make Handee the perfect tool. With 7 accessories **$20.50.** In carrying case with 40 accessories **$27.50.**

PLASTIC-CRAFT KIT. All materials needed for internal carving (Handee not included) **$6.95.**

With Its Attachments and Accessories, Handee Performs More Operations with Greater Accuracy than any Other Tool of This Type.

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Send ☐ Handee Kit ☐ Handee Tool ☐ Plastic-Craft Kit
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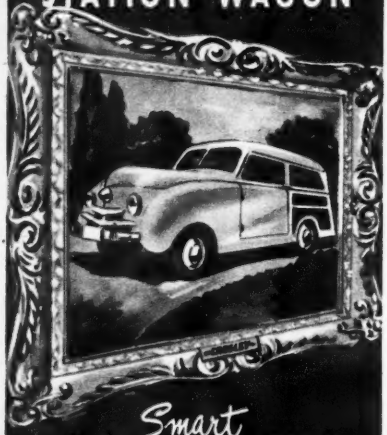

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Fashionable • Sleek
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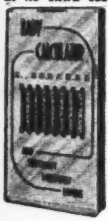

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Dept. 349, P. O. Box 248, Glenview, Illinois

Who's Afraid?

[*Continued from page* 151]

ous"—it's only the rider who can make it so.

That weekend, I rode the Arrow uphill, downhill, on sandy roads and on hard-topped ones, at speeds up to 40, and I didn't take a spill nor even come close to taking one. In high gear, at moderate speed, I rode no-hands for nearly a block without swerving. I took my wife along as a passenger on the rear fender—and the lady I work for not only was unafraid but was actually enthusiastic about the whole thing. I rode (alone) through heavy traffic on the Boston Post Road—one of the busiest highways in the country—and wasn't scared at all. And I taught three teen-age kids—a neighbor's son and our own two daughters—to ride the motorcycle with even less difficulty than they had learned to ride their bicycles.

SPECIFICATIONS OF THE INDIAN ARROW

Engine:	Air-cooled, overhead valve, single cylinder. Bore 2.375", stroke 3", displacement 13.3 cubic inches. Compression ratio 7 to 1.
Clutch:	Controlled by lever on left handlebar.
Transmission:	Four speed, constant mesh. Gear-change lever operated with left toe.
Fork:	Telescopic, hydraulically controlled.
Tires:	3.25 by 18, special motorcycle design.
Top Speed:	Approximately 60 mph.
Gas Consumption:	Approximately 90 miles per gallon.
Weight:	245 pounds.
Wheelbase:	53½ inches.
Price:	$575.00, F.O.B. Springfield, Mass.

Don't get me wrong—I don't consider myself an expert motorcycle rider, nor even a good one, after a few hours' practice. But I'm still amazed that, at the age of thirty-seven, I could overcome a deep psychological fear of motorcycles so quickly and learn to handle myself on one as creditably as I do.

Twenty years ago I swore, "They'll never get *me* on one of those things again." Well, they don't have to. I'll get on one myself and ride it—any time you say. Who's afraid of motorcycles? Not me. •

English M.G. a Bit of O.K.

[*Continued from page* 92]

way Patrol: sorry, fellas, we thought we were in Nevada). The M. G. was doing exactly 81 mph. In a matter of three or four miles I overtook and passed him.

But then, in the next 200 miles, which for the most part was a two-lane highway, he beat my brains out with ease. The Mercury had a five-mph top speed advantage on a straightaway and every time we came to a long, steep grade I beat him to his knees. The rest of the time, he made me feel like an idiot.

He was so agile he could whip by me, riding the inside shoulder or squeeze by on the outside where there wasn't enough room for my Mercury. On winding portions of the road he drove me crazy. He could take a flat, hard curve at 75 and not lean as much as two degrees while I was pulling every trick in the books to keep from rolling over.

After nearly 200 miles, I had to stop for gas and would gladly have quit the whole business. However, my pal pulled over and waited —M. G.'s are good for 450 miles on a full tank. So, we were off again! My wife, who was more than a casually interested observer, tried keeping records while she held on. On one 40-mile stretch, we averaged more than 78 mph. In a two-hour period we did 123 miles. At Salinas I finally caught up with my tantalizer and signaled goodbye. I was never so glad to give up anything in my life!

But this test has a story-book ending. Later, in order to personally test an M. G., I was instructed to contact Mr. H. M. Rummins, technical advisor for the car in this country. I told him over the phone about my brush with an M. G. He replied that during recent months he had engaged in unscheduled races with almost every kind of American car. Only one of the entire bunch had given him trouble—a '48 Mercury. Imagine our surprise when we met. He was the guy I had raced up the coast!

The M. G. can outperform any car made in America. It requires no effort to drive 75 mph, even on winding roads. The car, when equipped with a supercharger, will do better than 100 mph. Without one, it will make between 79 and 82 mph. To avoid confusion about the statement that the M. G. can outperform any American car, let me say that I know four American cars with higher top speeds on straightaways. All but two would burn up at these speeds if held for more than 30 miles. The M. G. can keep it up. On average coast-to-coast highways the M. G. would make fools out of all American cars trying to stay with it.

No wonder the public has already begun to call the M. G. by its nickname—Midget Giant! •

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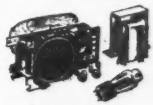

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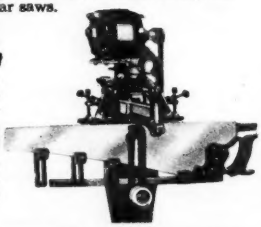

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Television Kit Roundup

[*Continued from page* 149]

firms marketing television kits on a national scale. Their products and sales approaches are somewhat different.

Tech-Master Products Company, 123 Prince Street, New York 12, N. Y., concentrates on a single model, a 30-tube, 10-inch picture tube job selling complete with tubes but no cabinet for about $200. This is a counterpart of the RCA Model 630TS, regarded in the trade as one of the best engineered sets now in use. The original RCA design is incorporated intact; in fact, RCA obligingly sells Tech-Master many of the important parts. This set is intended for people with a fair amount of experience in radio building, and definitely not for rank beginners; a complete schematic diagram and a copy of the RCA service manual are provided, but no step-by-step instructions.

Philmore Manufacturing Company, 113 University Place, New York 3, N. Y., offers a 25-tube set with semi-completed chassis, adaptable for 10- or 12-inch picture tubes and selling for about $200. Detailed step-by-step instructions are included.

Electro-Technical Industries, 1432 North Broad Street, Philadelphia 21, Pa., puts out two kits with beginner-type instructions (an excellent 40-page book): a 17-tube, 7-inch picture tube model, for about $100, less cabinet, and a 19-tube, 10-inch picture tube size for about $165.

Television Assembly Company, 540 Bushwick Avenue, Brooklyn 6, N. Y., sells a 30-tube kit with a choice of 10-, 12- or 15-inch picture tubes, at about $230, $260 or $350. These are suitable only for assembly by television technicians or "hams" with a good working knowledge of television fundamentals. Independent service dealers use many of these sets for custom installations.

Espey Manufacturing Company, 528 East 72nd Street, New York, N. Y., has the smallest television kit of all: an 18-tube set using a 3-inch picture tube and selling for about $100. This is presented as a "students'" set. Detailed step-by-step plans are given, but the tuning circuits are not pre-adjusted, as they are in all the previously mentioned kits. Since a signal generator and a vacuum-tube voltmeter are required for the alignment process, which is decidedly difficult, this kit is suitable only for learning purposes in schools. The image is very small (about 1¾x2 inches) and must be viewed close-by.

All television receivers must be treated and handled with great care because of the very high voltages required for the cathode-ray tube, on whose exposed end the television

pictures appear. These voltages range between 1,000 and 8,000 (yes, *eight thousand*) volts. That they represent an extremely dangerous hazard is stating the situation mildly. Some of the big projection-type sets, found mainly in taverns and other public places, work on 30,000 volts, and for this reason are greatly disliked by service men. The reduction of these lightning-like voltages is the subject of much study by television engineers, but until the values are reduced, the best advice that can be offered is: BE CAREFUL. If the precautions given in all the instruction books are followed, there is really little danger of shock, but every person who works on a set must understand that the danger exists anytime the power is on and the chassis is exposed.

It is a tribute to the skill of American hobbyists that only a very, very small number of the thousands of kits sold by one firm had to be returned for checking. •

1949 Buick Convertible

[*Continued from page* 146]

the positioner notches, the wheel angle is changed.

Next, paint the interior, cut the dashboard instrument outlines from the full size plans and cement in place. Make the steering wheel, build up the seats from the prescribed balsa, finish and set aside.

Now you can finish the exterior. Apply another coat of wood filler, sand down with 00 paper and then carefully brush on your favorite color dope or lacquer.

Apply at least three more thin coats, sanding between each, and when the grain is eliminated entirely, score the body for various door, trunk, hood and fender outlines with a blunt instrument that will not cut the surface but merely make a slight indentation in the wood. Then add two more coats of dope or lacquer, rub down the final coat with an automotive rubbing compound, or if not available, a 50-50 mixture of kitchen scouring powder and Johnson's Liquid floor wax.

Now cut the various fender trim strips from 1/16 in. dia. hardwood dowel, paint silver, and cement each in place. Cement the celluloid windshield in place and trim the edges with cellulose gift wrapping tape, which is purchased in ¼ in. width and should be cut down to 1/16 in. wide strips. Stick a length of tape on a piece of glass and cut, using a straight edge and razor blade. The ¼ in. diameter brass or nickle grommets (which are used in many shoes as shoe lace reinforcements) are next imbedded into the fender sides. Add the bumpers, the black or tan paper covering for the "boot" behind the rear seat and your project is complete! •

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Be Young at 100!

[*Continued from page* 63]

Nepal, India, and is just 160. His grandparents, he reports sorrowfully, are no longer living.

James M. Lurvey, a boy of 100, in Goffs Falls, N. H., attributed his longevity to sturdy ancestors, big breakfasts and morning coffee "with a little stick of whiskey."

On his 100th birthday last December, Lurvey admitted:

"I'd like to have some brandy in my morning coffee instead of whiskey, but it's a bit too high for my pocketbook."

Captain Dennis Tormey, an ex-tug and coal-boat skipper, who celebrated his own centennial on Staten Island this year, openly sneers at the "live-moderately" faction of centenarians.

"When I went to sea, I drank hard liquor," he proclaimed on his birthday. "I never took good care of myself and I never expected to live to be 100 years."

On one point, virtually all centenarians and medical authorities are in complete agreement—the lazy life is a peril for the older folks.

Dr. Clarence A. Neymann, Associate Professor of Psychiatry in the Northwestern University Medical School, recently warned anyone who has retired not to give up all activities. If you strive to be blissfully idle, you may have to reckon with senile dementia, a condition he described as a "gradual narrowing of the mental horizon, with interest in the outside world giving way to preoccupation with the immediate surroundings, a disregard of today's happenings in favor of those of yesteryear, and eventually the confining of interest to the primordial stimuli of food, sleep, warmth and other bodily needs—a childlike state."

Miss Florence Dolph, 101, of Dunmore, Pa., is an ardent subscriber to Dr. Neymann's beliefs. By way of celebrating her 101st birthday last year, she started the festivities by sliding down the banister—as is her custom every birthday. In answer to a newspaperman's query about her technique, she pointed out heatedly that she slides astride the banister—not in the effete sidesaddle manner.

A certain similar pattern of living runs through the statements of most centenarians who try to arrive at the reasons for their longevity. Most, for example, feel that strong drink has assisted them materially in turning their personal century.

The same Dr. Bortz who thinks that we should all live to 150 calls whiskey a helpful tonic to the aging—"a lift to the spirits and soothing to the jangled nerves."

"Whiskey," he adds, "is certainly one of the best sedatives when used in adequate quantity." It is, he sums up, probably the most useful aid a physician can enlist in treating elderly patients.

A well-balanced diet is another help in hitting a hundred. Gereaud Van Dyne, of Rochester, N. Y., attributes his healthy 103 years of life to good food, well prepared. His cook? None other than Gereaud Van Dyne himself.

"I feel younger as the years go by," he says happily.

On his 100th birthday, Edmund Welden, of Valley Falls, N. Y., observed that he was thinking of getting married when he reaches 110. "I probably would have died when I was 50 if I'd been a married man," he added.

But the advantages of single blessedness throughout life are strongly questioned by Pundit Mahangoo, of Georgetown, British Guiana, who celebrated his 106th birthday by getting married for the third time.

Another point that comes up with any examination of the habits of centenarians is—*Watch Your Step!* Countless centenarians who were "never sick a day in their lives" died suddenly after falls—usually involving a broken or injured hip.

A Mr. J. C. Bee-Mason, a British bee expert, says authoritatively that anyone can live to be 100 by letting as many bees as possible sting him as the years go by. This is the procedure confidently followed by Mr. Bee-Mason, who has not yet, however, become a centenarian himself. Before rushing out to follow his advice, it might be a good idea to see whether he finishes that hundred race.

But one of the most unique, and tasty, recipes for living to be 100 is provided by Mrs. Susan Stewart, of Saxonburg, Pa., who celebrated her 101st birthday early in 1948. Mrs. Stewart recommends doughnuts—after they've been properly dunked, of course.

"I've dunked doughnuts by candlelight, by oil lamp, and by electricity," she reminisced on her recent birthday.

Many of the oldtimers we've mentioned have followed their own pet recipe for reaching 100. They're often at odds about just how they did it. Here are a few tips, though, that may help you stretch out the years toward that happy hundred:

1. *Go light on your diet* when you find it heavy going on the scales.
2. *Drink moderately and only to relax* and be sociable—not excessively nor to drown your sorrows.
3. *Keep active*—at both work and play. Lazy people seldom live long. So, don't retire from life—till you're ready to leave it!

[*Continued on page* 159]

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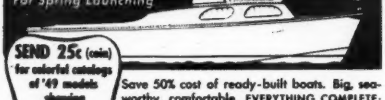

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Be Young at 100!

[*Continued from page* 157]

4. *Stop worrying.* It won't do any good—and it will help raise your blood pressure, upset your stomach and lower the spirits of everybody around you.
5. *Laugh at yourself* now and then. If you don't, other people will—and it won't be so funny for you. Laughter gives you that wonder-working longevity vitamin—happiness.
6. *Be friendly with your doctor*—but don't pester him with imaginary ills.
7. *Forget all you ever heard about the troubles of old age.* It's mostly superstition, anyway.

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of MECHANIX ILLUSTRATED published monthly at Greenwich, Conn., for October 1, 1948.

State of Connecticut } ss.
County of Fairfield }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Gordon Fawcett, who, having been duly sworn according to law, deposes and says that he is the Business Manager of MECHANIX ILLUSTRATED and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly, or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, Fawcett Publications, Inc., Greenwich, Conn.; Editor, William Parker, Mamaroneck, N. Y.; Managing Editor, Ralph Daigh, Pelham Manor, N. Y.; Business Manager, Gordon Fawcett, Greenwich, Conn.

2. That the owner is: (If owned by a corporation, its name and address must be stated, and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Fawcett Publications, Inc., Greenwich, Conn.; W. H. Fawcett, Jr., Norwalk, Conn.; Marion Bagg, Kansas City, Mo.; Roger Fawcett, Greenwich, Conn.; V. D. Fawcett, Greenwich, Conn.; M. B. Fawcett, Norwalk Conn.; H. A. Fawcett, Greenwich, Conn.; Roscoe Kent Fawcett, Greenwich, Conn.; M. F. Fawcett, Greenwich, Conn.; W. H. Fawcett Trust, Greenwich, Conn.; M. B. King, Oxnard, Cal.; Gloria Leary, Oxnard, Cal.; Y. F. Kerr, Santa Barbara, Cal.; Mrs. Eva Roberts, Seattle, Wash.; Fawcett Publications, Inc., Greenwich, Conn.

3. That the known bondholders, mortgagees, and other security holders owning or holding one percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is ——— (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

GORDON FAWCETT,
Business Manager.

Sworn to and subscribed before me this 17th day of September, 1948.
[SEAL] LILLIAN M. BUSHLEY.
(My commission expires April 1, 1953.)

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McCahill's Dream Car

[*Continued from page* 69]

governor for free-wheeling the fan at speeds above 47 mph. After 47 mph, the fan no longer has any cooling effect and just gets in the way. It also robs the engine of up to 10 hp at 60 mph, depending on the blade.

Another feature, found on good automobiles of the past, was the dual battery and magneto ignition. Modern American car ignition is a cheap farce when compared with the ignition on top-grade cars of 30 years ago. The reason is simple. Battery ignition is superior to magneto only at slower speeds. At top speeds, when you need all the spark you can get, the battery ignition almost fades away. On the other hand, the magneto improves as speed builds up so that you are getting your hottest spark at top speed.

The oldtimers who combined battery and magneto had something. They were sure of top ignition at all speeds on such cars as the Rolls-Royce, Pierce Arrow, Crane Simplex, Locomobile and Mercedes.

Carburetors as we know them today are another insult to the good automobile man. There is no adjustment on modern American carburetors aside from the idling adjustment. In the past, the great Winfield carburetor had idle, intermediate and high-speed settings plus acceleration-pump adjustments. With this carburetor a man who knew what he was doing could really tune an engine up, far above what we can do with today's jalopies. Not only did you get better performance but you could adjust these carburetors, in seconds, for any climate or altitude. Good automobile men now are forced to get along as best they can with a foolproof carburetor, designed for Jerky John or Grease Monkey Martin who would actually ruin a good carburetor through stupidity. For my car, I'd go to my friend Bud Winfield on bended knees and ask him to design and build me one like those he made some 20 years ago.

While on adjustments, I'd go back 35 years to the original Silver Ghost Rolls-Royce design and bring back a hand-operated spark and throttle control, plus mixture control. I'd have it just the way they had it then—right in the center of the steering wheel.

Another feature would be an auxiliary radiator for extra cooling surface, for hot weather, extremely fast or traffic driving. This would be controlled by a simple turn-off valve, which would add an extra two gallons of liquid and cooling surface.

On the dash I would have, in addition to the speedometer, a tachometer to register engine rpm's. The correct way to drive a car, as

[*Continued on page* 162]

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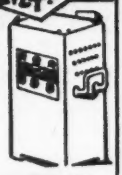

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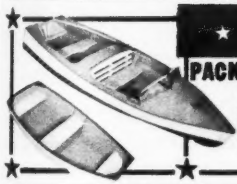

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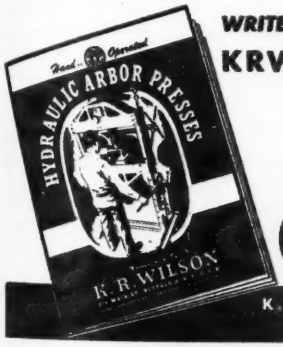

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McCahill's Dream Car

[*Continued from page* 160]

all auto experts know, is by a tachometer. On hills or under heavy loads the experienced man knows that the most important thing is to keep the rpm's up. If they start to fall off you should shift immediately, as horsepower drops. The tachometer should be your guide in building up speed, too.

The tachometer also shows at a glance whether the engine is up to snuff, whether any valves are sticking, whether the timing is late or the carburetor adjustment off. If you have a miss, you can spot it quickly.

It's an old wives' tale that if a car is adjusted for economy it won't have full power and speed. The throttle setting at which you get the most rpm's is the one which gives you the greatest economy, power and speed. With a tachometer, almost anybody can make minor adjustments or diagnose trouble.

Suspension causes a lot of manufacturers to go overboard today. Nearly all American cars feature coil springs, on the front at least. You won't find 'em on the McCahill MI. My car will have extra long leaf springing like the Rolls, torsion-bar stabilizers and double-action shocks. It won't be quite as easy on your backsides, though this difference will be negligible. But it will be twice as rigid on curves and will really hold the road.

Tires—let's not get me started on this. Mine will not be the so-called super-balloons but 15x6.50's. These also will vastly improve my roadability and turnability over the new doughnut boys, and I won't be worn out from just steering after 500 miles or so. My steering wheel ratio will be much less than that used for the super balloons. My car will be quick turning, like the English MG, and you'll really be able to steer. You no longer steer American cars—*you aim them.*

My car will offer the buyer a choice of two engines. The standard will be a lot like the Ford V-8 with the power-plant changes already mentioned. It will develop 100 hp with no souping up. This will be plenty, since my car will weigh less than 2500 pounds. For the real auto man, my second choice will be a four-cylinder Offenhauser racing engine. Not quite so smooth as the V-8 but what snap and performance! With the V-8 engine the car will have an approximate top speed of 105 mph and cruise at 90 mph. With the Offenhauser it will have a top of about 120 mph and cruise at 100 mph.

The McCahill MI may cost you fifty grand or so. That's a lot of ransom to raise—even for a real man's car. But take it from me, fellow, if you're a bug about dreamboats, it'll be worth every dime!—*Tom McCahill*

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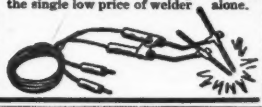

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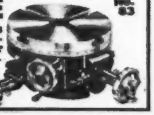

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[*Continued from page 77*]

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In some sections of the country, the sale of rabbit meat ranks close to beef and fowl. But in other places it has been slow in becoming popular because there is no steady source of supply. We are now getting about 70 cents a pound, dressed weight, for our rabbits. We sell them through the same channels as poultry is sold or arrange deals with local butchers and frozen-food dealers.

A great part of our business comes from mail-order sales of breeders. They're fine as pets, too. We average about $100,000 a year gross sales in live specimens.

What are *your* prospects for a successful future in rabbit farming? I can only quote my own experiences.

The first year there will not be very much profit. You can expect to build up your breeding stock and make back your original investment plus about 10 or 20 per cent.

The second year you can expect to make about three or four times your original investment. From there on, the extent of your development and your own sales ingenuity are the only things that can hold you back. We net about $10,000 a year ourselves.

Make sure you don't neglect the mail-order business—it offers unlimited possibilities and doesn't restrict you to your own local markets. We even sell mail-order rabbits on the installment plan.

Just recently we received an order for a trio of rabbits on our easy-pay policy and asked the buyer to list his assets. He painstakingly enumerated them in the following order:

2 horses
7 goats
3 cows
7 children
1 wife

Soon he'll be able to put three chinchilla rabbits at the head of that list!

I believe rabbit raising is one of the few businesses that pay good dividends when started on a small scale. I suggest you buy only a few rabbits at the beginning and raise them until you understand the fundamentals of rabbitry.

Then you can expand just about as fast as your rabbit population. And you know how rabbits are! •

WITH MOLLY YOU CAN FASTEN ANYTHING and do it quickly, neatly and safely. MOLLY will hold fixtures securely to floors, ceilings or any hollow wall construction... Simple to install, all you need is a screw driver. Sold by leading hardware stores everywhere.

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Where Screws Won't Hold—Use MOLLYS

BUILD OR BUY A *Rotary* SNOW-PLOW

NO MORE STRENUOUS SNOW SHOVELING!

Clean off your snow the easy LeJay Way. It is easy to build your own Snow Plow. Operates from small gas engine or electric motor. Cleans an 18 inch path. Swirls the snow to either side. Plan is thorough and easy to follow. Enjoy making one of these Snow Plows from new or used parts. Mail 35c today for complete plans and catalog. LEJAY MFG., 214 LEJAY BLDG., MINNEAPOLIS 8, MINN.

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CONSTANTINE MASTER MANUAL

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Indispensable to woodworkers. Newest, biggest edition, more pages, more color, helpful how-to-do-it articles, pre-war and new items, more bargains. Send 25c today and we will include ***FREE! FULL YRS. SUBSCRIPTION*** to Chips and Chats, published bi-monthly. Keeps you up-to-date on everything in woodworking, offers big money-saving bargains. Send now.

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A faster brush cutter and wood sawing machine. Propels itself while cutting saplings and brush. 7 H-P motor. Many outstanding and exclusive features. Available attachments: sickle bar, rotary tiller, sprayer, air compressor, snow plow and pulley for belt work. Thousands in use. Send for FREE booklet.

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SPITFIRE Coil and Lead — ONLY $1.50
High output matched unit for Mohawk Chief Spark Ignition Engine.

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MAKES NEW PROFITS

Cuts new teeth in 50 seconds! Any size tooth 4 to 16 points. Old teeth fall off as chips. Simple to operate! A perfect job.

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Sharpen circular saws Accurately—Quickly—Safely any size 6" to 60" with an Acme Circular Saw Sharpener. Write for details today!

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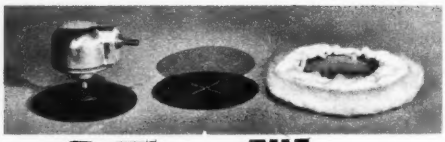

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You polish and sand **faster, easier**—do beautiful **professional** work—with this amazing new attachment for your electric drill! More than pays for itself **the very first time** you make your car, floors, furniture, woodwork gleam like new.

Fits any chuck on an electric drill or flexible shaft. Swivel action makes it easy to reach all curved or flat surfaces. Packed with power, built to last, **guaranteed.** Thousands of satisfied users. Only $9.95, complete with five-inch rubber disc, sheepskin bonnet, 2 sanding discs. Order at your dealer or send cash, check or M. O. **today—while we can still promise delivery before Christmas. $9.95**

Literature on other drill attachments available

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Genuine WESTERN ELECTRIC

MICROPHONE

plus ASSEMBLY UNIT

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$1.00 POST PAID IN U.S.A.

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REFRIGERATION SYSTEM FOR FREEZERS

12' TO 20' CU. FT. CAPACITY

Package unit consist of: ½ HP Refgr. Machine—Control—Expansion Valve—Dryer—Liquid Indicator—130' ½" Refgr. Tubing for Freezer Coil—Necessary Fittings, Plans and Instructions for complete Installation. All New Equipment of Nationally Known Mfgr.

THIS IS A COMPLETE REFRIGERATION SYSTEM FOR THE UNUSUALLY LOW PRICE..... $199.50

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Keep passengers perfectly dry—even at high speeds. Catalog also shows two new models of "Take-Along" Boats. Two big factories—save you freight.

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Write for your copy. State kind of boat in which you are interested.

THOMPSON BROS. BOAT MFG. CO. (151)

230 Ann St. *(Write to either place)* **130 Elm St.**

PESHTIGO, WIS. **CORTLAND, N.Y.**

Editor's Workbench

[*Continued from page 20*]

Maerz Special

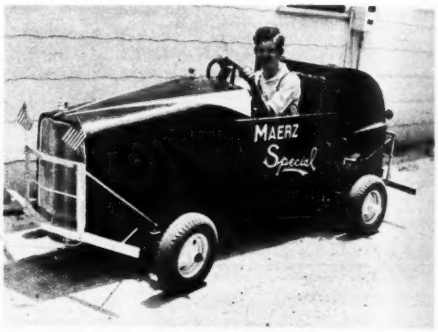
Dear Editor:

We are submitting enclosed photo for your workbench column for our son (he is unable to write).

He calls it the small car with the big car features. It has a self starter and is run with chain and belt drive.

Submitted for
Kenneth Maerz
3738 W. 148 St.
Midlothian, Ill.

by his parents



A newspaper clipping enclosed by Mr. and Mrs. Maerz tells of the pride which Midlothian, Ill. feels in young Kenneth Maerz. A brain injury at birth made him a spastic and doctors gave him two years to live. Now, at 21 he has become an expert mechanic despite the terrific handicap of his injuries.

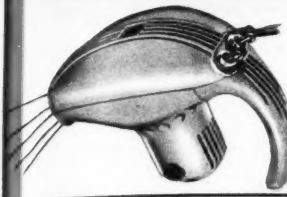
MI's editors are proud to present you with a $5 Workbench Award, Kenneth. And we're looking forward to seeing more samples of your fine craftsmanship.

Book Notes

THE STARS ARE YOURS by James S. Pickering; published by the Macmillan Company; 264 pages; $3.95.

A worthwhile companion to readers constructing MI's Telescope. Mr. Pickering presents many interesting and little-known facts about the universe in an entertaining style rarely associated with astronomy. Can you imagine stars 650 million miles in diamster (800 times that of the sun), and stars with a density so great that one cubic inch weighs a ton?

RADIOMEN'S HEADQUARTERS ✧ WORLD WIDE MAIL ORDER SERVICE!



HEAT GUN

Streamlined pistol grip heat gun in vivid red housing, that delivers a powerful 20 Cubic Ft. per minute blast of hot air at 160° Fahrenheit. Ordinary blowers have small fan motors, but this has a lifetime-lubricated AC-DC motor of the rugged vacuum cleaner type, that produces a hurricane of either hot or cold air. Perfect for blowing out dirt or dust, drying out ignition systems, warming up carburetors, drying paint, thawing out radiators, etc. Warning:—Keep this away from your wife, or she will be using it to dry her hair because it will do it in half the time of her ordinary hair dryer, to say nothing of her using it to dry stockings or clothing, or defrost the refrigerator instantly. Only $12.95. Satisfaction guaranteed or money refunded if returned prepaid within 5 days.

Terrific Value

ONLY

$20.95

Equipped with 1/4" Jacobs Geared Chuck and Key

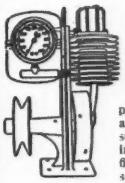
PORTABLE ELECTRIC DRILL

(Sold at less than established factory price so we cannot mention brand name)

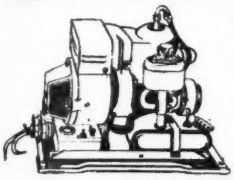
Not an intermittent duty drill, but a full size rugged tool. Most convenient type switch, natural grip handle, and balance like a six shooter. Precision cut gears—turbine type cooling blower—extra long brushes. No stalling under heaviest pressure because of powerful 110 Volt AC or DC motor and multiple ball bearing thrust. Other bearings self-aligning lifetime-lubricated Olite type. Made for toughest year-in and year-out service in plant or on construction jobs. Amazing perpetual factory guarantee assures you of a lifetime of trouble-free use.

Full refund (you pay transportation) if not pleased with drill after trial.

COMPRESSED AIR INSTANTLY, Anywhere!!



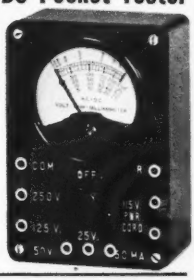
Portable Air Compressor and storage tank. Ruggedly built of best materials using lifetime lubricated ball-bearing on connecting rod and oil impregnated main bearing on shaft. Unusual design forever eliminates valve trouble, the most common fault in air compressors. **PATENTED** unique air intake system increases efficiency tremendously over other compressors so that air output is much greater than that from larger compressors powered by heavier motors. Will deliver appr. 3500 cu. in. air per min. at maintained pressure of 30 lbs., or will inflate a 90 lb. truck tire in less than 1 min. Complete with 100 lb. gauge, fingertip adjustment allows setting of output pressure at any value, which will automatically be maintained. Works from any 1/4 H.P. motor. Useful for spraying paints or lacquers, disinfectants, insecticides, annealing or brazing with natural gas, inflating tires, etc. Price $14.50 postage prepaid anywhere in U. S. Efficient, adjustable syphon type spray gun complete with 12 ft. of 100 lb. tested hose for only $7.75 with pint container, also prepaid. 25% required on C.O.D. orders.



PE-109 32-VOLT DIRECT CURRENT POWER PLANT

The price of this power plant tested and in good condition is only $79.95 F. O. B. Buffalo, or we can supply in strictly "as is" condition for $58.95 F. O. B. New York City. These latter are exactly as received, in heavy steel-strapped govt. cases, and we are unable to determine if the individual units are new or used or what the condition is if used, while the $79.95 units are some of the same that we have brought to Buffalo for testing and for repair if necessary. We can also supply a converter that will supply 110V AC from the above unit or from any 32V DC source for $12.95.

Sensational Value in AC-DC Pocket Tester



This analyzer, featuring a sensitive repulsion type meter housed in a bakelite case, represents the culmination of 15 years achievement in the instrument field by a large company specializing in electronic test equipment.

Specifications of the AC-DC Model Volt-Ohm-Milliammeter:

AC Volts—0-25,50,125,250
DV Volts—0-25,50,125,250
Milliamperes AC—0 to 50
DC Milliamperes—0 to 50
Ohms Full Scale—100,000
Ohms Center Scale—2400
Capacity—.05 to 15 Mfd.

Total Price, prepaid anywhere in the USA—$7.00.

Similar DC Meter, lacking the AC operated ranges of above, $5.50 prepaid.

RT-1248 INTERCOMMUNICATION TRANSCEIVER

This brand new 15 tube transmitter-receiver was designed for mobile service on 12 volts, and will operate in the "Citizens' Band," where no amateur license to transmit is necessary. It's a cinch for any experimenter to connect this unit for 110 V AC operation by following the instructions and diagrams supplied, which cover numerous applications, including television. For those intending to use on car or boat, a new dynamotor, exactly as originally supplied, costs only $15.00. Don't fail to write for **FREE** descriptive bulletin. RT-1248 transceivers only **$29.95 each**, or **two for $53.90.**

Have You Been Asked $70.00 for a New Car Radio?

Nationally advertised brand of 1949 car radio which will fit practically any car and every pocketbook. Six tube superheterodyne with three gang condenser and 6½" speaker. **$32.20 for sample, or Dealer price $29.97 each, in lots of two or more.**

RADIO SET SCOOP

Product of a famous aircraft radio manufacturer that has abandoned the manufacture of the table model radios because of the flood of govt. orders. All in 5 ply genuine mahogany cabinets, both regular and bleached. 6 tube models have tone control. Original list price given first—then your cost. Sensational discounts.

Model 565, Mah. or Blonde—$34.95—$20.97
Model 6618, Mah. or Blonde—$44.95—$20.97
Model 663, Mah. or Blonde—$46.95—$21.97

All sales final and no returns unless otherwise specified in ad of item. Right reserved to change prices and specifications at any time.

$10.95 *TAKES ALL THREE*

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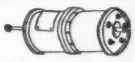
1. SENSATIONAL, FASCINATING, MYSTERIOUS SELSYNS. Brand new Selsyns made by G. E. Company. Two or more connected together work perfectly on 110V AC. Any rotation of the shaft of one Selsyn and all others connected to it will rotate exactly as many degrees in the same direction, following unerringly as if the units were connected together by shafting instead of wire. This is true whether you twist the shaft of the master unit a fraction of a revolution or many revolutions. Useful for indicating direction of weather vanes, rotating directional antennas, or controlling innumerable operations from a distance. Complete with diagram and instuctions. Per Matched pair $4.95.



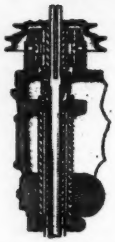
2. ALUMINUM GEAR BOX 18x8x7 that contains two powerful electric motors and two matched gear trains, 62 gears in all varying in size from ½ to 4 inches in diameter. This unit is readily converted to rotate a beam antenna or any other similar use $3.00

3. HOME WORKSHOP AT BARGAIN PRICE. Accurate and precise 2 speed guaranteed hobby lathe, the essential machine for the home workshop. Sturdy enough for light production work or factory standby service. Supplied with 56" of belting for connecting to any available electric motor or power take-off. Also included in this unbelievable offer are such accessories as a ½" drill chuck with specially hardened tool steel jaws, a 4" electric furnace high speed grinding wheel, a cotton buffing wheel with a large supply of buffing compound, and a 4" steel wire scratch brush. Your cost $6.00. Sole export agent. Distributor inquiries invited.

BUFFALO RADIO SUPPLY, 219-221 Genesee St., Dept. MI, BUFFALO 3, N. Y.

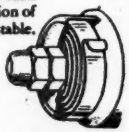
FOUR PRECISION BALL BEARINGS

Two on spindle, two on drive sleeve. Pre-lubricated and sealed precision type, no oiling required.



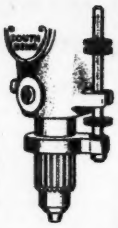
ADJUSTABLE QUILL RETURN SPRING

Retracts quill instantly upon release of feed lever. Tension of spring adjustable.



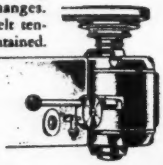
DEPTH GAUGE

Controls feed depth, length of return stroke, or locks spindle in any position. 16th graduations.



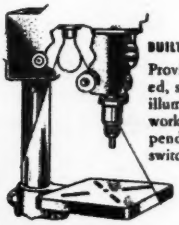
BELT TENSION RELEASE

Flip of lever removes tension from belt for easy speed changes. Proper belt tension maintained.



BUILT-IN LIGHT

Provides shielded, shadowless illumination on work area. Independent on-off switch is built-in.



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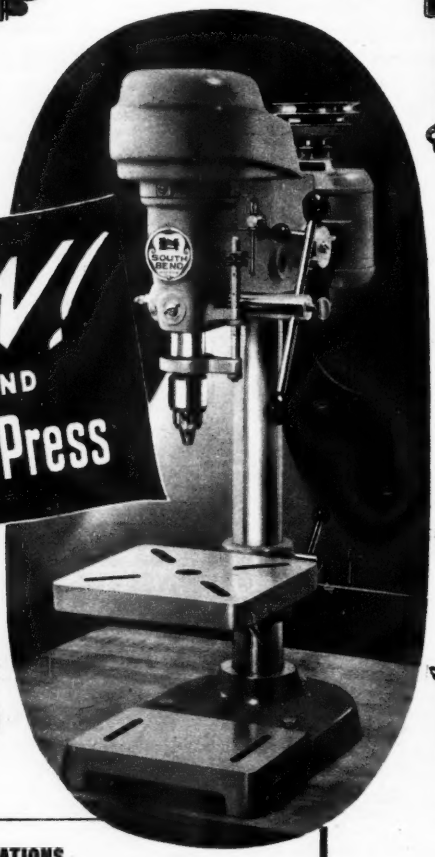
SOUTH BEND 14" Drill Press



INTERCHANGEABLE SPINDLES

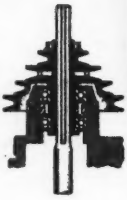
Spindles available to take No. 2 Morse taper shank tools, and for 1/2" straight shank tools, router bits, shaper cutters, etc.

TABLE LOCK

Double-plug binder securely locks table to column. Eliminates misalignment. Column bearing is NOT split.

FREE-FLOATING SPINDLE

Design prevents misalignment, side thrust and whip. Precision splines in spindle and sleeve.



QUILL BEARING ADJUSTMENT

Shoe-type take-up provides feather-touch tension and secure locking. Quill bearing is NOT split.

CAPACITIES — SPECIFICATIONS

CAPACITY
Maximum drill size in iron or steel — ½". Drills to center of 14¼" circle.

CHUCK
Capacity — 0 to ½"

SPINDLE
Regular drill chuck type supplied. Travel ..... 4"

CHUCK TO BASE DISTANCE
Bench Model — 17"
Floor Model — 46½"

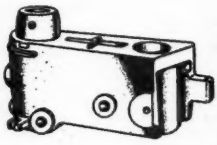
SPINDLE SPEEDS
Four — 655 to 4530 r.p.m.

TABLE SIZE
10" x 10". Tilts to any angle.

Bench Model **$129.30**

Floor Model **$144.30**

Prices, f.o.b. factory, include drill chuck and 1/3 h.p., 115 or 230 v., 1 ph., 60 cycle motor and switch.



ONE-PIECE HEAD CASTING

Insures perfect alignment. Double-plug binder locks the head to column. Column bearing is NOT split.

SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906 • 433 EAST MADISON ST., SOUTH BEND 22, INDIANA

OIL BURNER

INFORMATION IN A HANDY FORM

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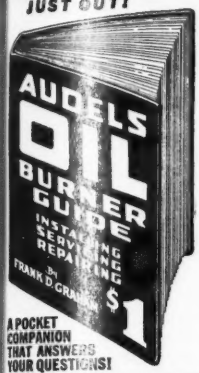

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New from Cover to Cover, for mechanics interested in Oil Burners. Gives practical inside working knowledge of theory, construction, installation, operation, testing, servicing and repair of all types of oil burners. Includes electrical hook-ups and wiring diagrams of automatic control systems.

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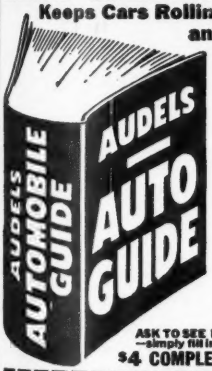
Keeps Cars Rolling by Making Repairs and Adjustments Easy!



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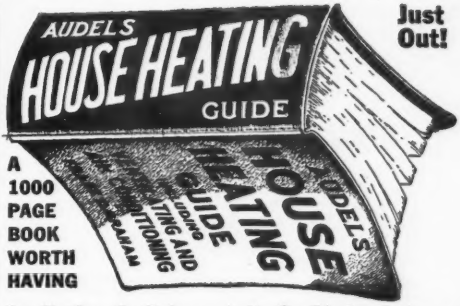

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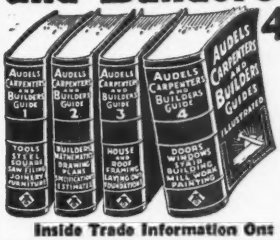

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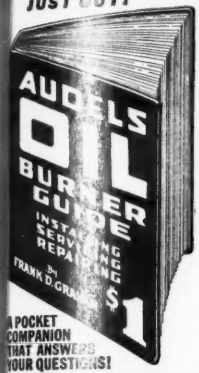

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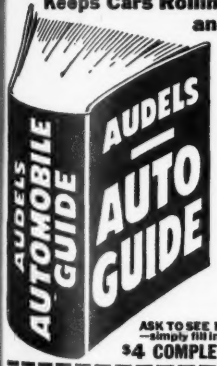

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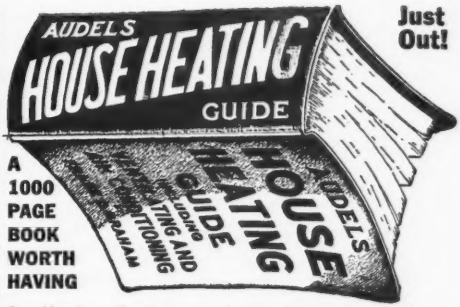

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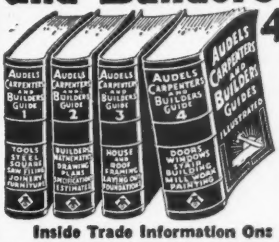

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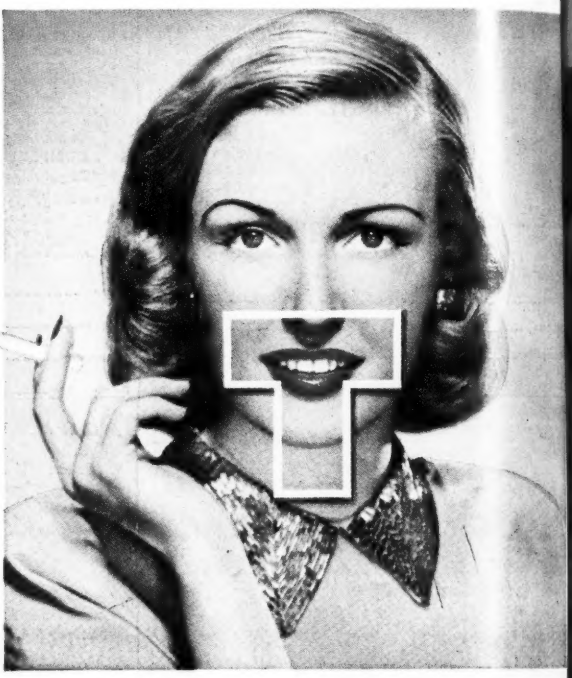

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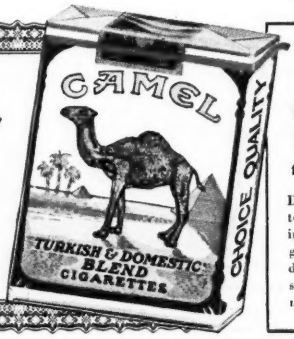

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